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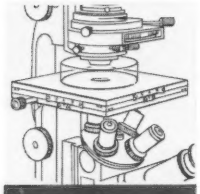

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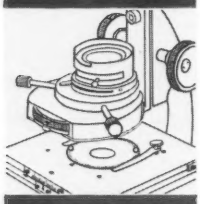

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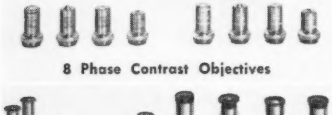

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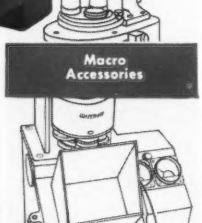

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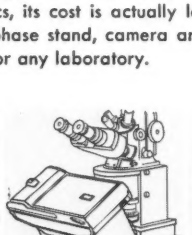

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COVER: "Piggy-back" *Hydra* attached to the carapace of *Diaptomus shoshone*. These specimens were taken from a 60′ depth in a Colorado mountain lake. It is suggested that this may be a symbiotic relationship at a near-microscopic level. Photo by John R. Olive

The AIBS wishes to increase the variety and interest of the photographs used in its publications and therefore invites contributors to submit photographs in all fields of biology for use on the cover of the Bulletin.

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By DR. G. B. DUCHENNE (of Boulogne). Translated and Edited by EMANUEL B. KAPLAN, M.D., Attending Orthopedic Surgeon, Hospital for Joint Diseases; Associate Professor of Clinical Anatomy, College of Physicians and Surgeons of Columbia University. 612 pages with 101 illustrations. $11.00.

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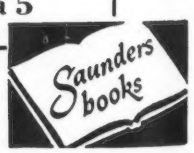

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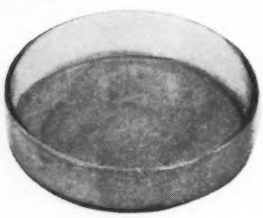

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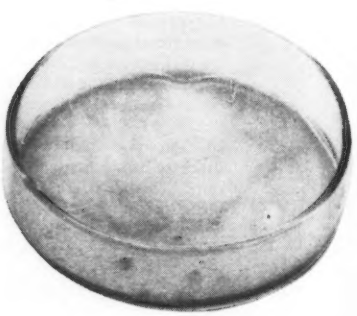

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Historically, scientific societies have evolved out of the personal interests and self-sacrifice of their founders. The editorship of a small journal was a labor of love, to which a distinguished man would devote his leisure hours. Similarly, the business services of scientific organizations were carried on by men dedicated to the ideals of the societies.

Such dedicated people are now required to be more self-sacrificing, more tireless, and more the captives of their jobs. This has occurred because increased research has flooded our editors with tremendous numbers of papers. Also, the secretaries and treasurers are involved in many additional activities, inter-society committees, federation work, etc. The management of journals and the business of scientific societies have suffered because small organizations have not been able to attack their economic problems efficiently. Moreover, science itself has lost because of the heavy load that editors and business managers have had to bear; highly trained talent has been wasted on routine chores.

Hope has been expressed that the AIBS could aid biological societies in relation to these problems, and for at least seven years the AIBS Publications Committee has considered various means to effect savings and increased efficiency in journal production and the management of routine business. At an editors' meeting held in New Orleans in 1957, under the auspices of AIBS supported by the National Science Foundation, the Conference of Biological Editors was established. Since then, a committee on joint publication has functioned in close collaboration with the AIBS. The result is a proposed study of the feasibility of establishing joint editorial-business management offices to serve the needs of biological societies. The essential concept is that *the societies can remain completely independent in their editorial policies and the conduct of their affairs,* but that routine and mechanical work can possibly be done more economically in a single establishment. The AIBS Publications Office is a logical place for such services—two societies are already being served there. However, most societies are reluctant to enter a "blind deal" until costs and economics are more clearly delineated.

Various questionnaires have been sent out in an attempt to analyze the costs of journals and societies. However, these questionnaires cannot achieve an accurate enough estimate because of hidden subsidies such as the provision of space and secretarial help by the editor's own institution, volunteer workers, etc. We require *exact* data to make good cost estimates. The individual societies can then decide whether or not they can use the service.

The requirement, actually, is for a trained, experienced publications and business manager to make a thorough study of the operations of interested societies. As requested by CBE and AIBS, the National Science Foundation has granted a financial subsidy for the study. We also have the man available in the person of the Director of Publications of AIBS. The project is expected to require about six months, after which a detailed plan will be formulated and proposals made to interested societies. Societies that have not yet expressed an interest, but wish to be included in the study, are invited to direct their inquiries to the AIBS Publications Office.

LEON JACOBS
Chairman, Committee on Cooperative Publication,
Conference of Biological Editors

The Democratic Process in the Future of Biology*

ORR E. REYNOLDS, *Director, Office of Sciences, Assistant Secretary for Research and Development, Office of the Secretary of Defense, The Pentagon, Washington, D. C.*

IN 1958 the Soviet Union launched a rocket intended to go into a lunar orbit. Unfortunately, the trajectory was not precisely right and "lunik" vanished into space. Recently, rumor has it, the Soviets succeeded in successfully launching "manik" a manned space vehicle with the objective of overtaking "lunik" and recovering the priceless data recorded by its instruments. The two inhabitants of "manik" cruised through space for many months following the computed true trajectory of lunik until to their surprise, not to say disbelief, they arrived at the gate of Heaven. Here they were greeted by Saint Peter who, being displeased by their arrival, not only because of their unconventional route, said: "What do you boys want here? You don't even believe in God, let alone in Heaven." The Russians, greatly discomfitted by the turn of events, blushed, scuffed their feet and finally stammered, "Please sir, can we have our ball."

THIS leads to the topic for my address. You may be able to discern some relationship to the published title. My theme really is "You've got the ball."

Planning for Goals

The point on which I want to expand, and which I'll try to defend, although perforce by intuitive reasoning, rather than the presentation of data, is the necessity of some concerted planning by biologists on a national basis to determine what our goals are for futhering our field of science and what our requirements are for meeting those goals.

I realize that planning, and organization to accomplish it, is frequently considered anathema by biologists, because of the fear that it will result in regimentation and loss of freedom and individual initiative. Therefore, I feel I must defend myself immediately on this point, and shall do so by referring you to the paradoxical fact, accepted, I believe, by most social scientists, although probably not proven by controlled experiment, that lack of organization most frequently produces loss of freedom because authority is seized by some individual or group either internal or external to the group. History is replete with examples of this in the relationships between cultural groups. In the contemporary scientific scene it appears that the fortunes of biology are being controlled primarily by decisions designed to meet the needs of the better organized communities of medicine, agricultural science and physical science.

As an example of this I often hear the statement that there is no capable scientist who does not have all the research funds and facilities that he can profitably use.—And I hear this from scientists, not from military men or laymen.

If you doubt the essentiality of the organized planning I propose, let me take a moment to go into the position of science in our country.

Since World War II the growth and development of American science has been increasingly a matter of public and governmental concern. The government now spends over 5 billion dollars a year on research, development and engineering—more than half of the investments in these pursuits by the country as a whole—substantially more than it spent during the first forty years of the century and more than the total federal budget of a generation ago.

The following is quoted from the President's Science Advisory Committee:

> "The heightened importance of science is increasingly imposing new requirements on Government to move forward on the broadest possible front. Research programs demand not only greater stability and continuity, but also, a more balanced division of effort among the various categories of research and development. Purposeful consideration needs to be given to the capital requirements associated with expanded scientific activity in order to support and exploit the tools of science themselves, and to provide scientific organization equal to the most advanced techniques.
>
> By properly relating science to its policy-making, by improving the management of its own research programs, and by devising thoughtful means for supporting research in private institutions, Government can more effectively use science and technology not only to solve today's specific problems, but also to provide in the years ahead continued leadership on a wide scientific front."

Are the needs of biology sufficiently well thought out and agreed upon that you would now trust any individual or even a small group of biologists, to represent the field adequately in this policy-making?

If I still haven't convinced you that planning and organization are necessary I have one more argument to use. The following is a direct quotation from a study by a capable social scientist entitled *Future Trends in Science as a Social System.*

> "The great increase in scientific personnel will produce several trends of change in science as a social system. Among them will be a great expansion of scientific production, increased scientific specialization, and increased collectivization and bureaucratization of scientific organization. The increased specialization in science has in the past and will continue in the future to force the growth of inter-disciplinary teams of specialists. This is particularly true when practical problems of considerable scope must be attacked, for no man's specialty is likely to be adequate to do the job. The formation of teams increases the problems of management, and when a single organization includes many teams, bureaucratization is the inevitable result. Problems which will therefore arise will include the determination of the right "mix" of specialties in the teams, choice of criteria for hiring, firing and promoting, and somehow finding a way to avoid scientific mediocrity while running an organization that is bound to insist on conformity to the group."

No doubt you all see many aspects of the foregoing now in process. I, in an amateur way, am forced to agree that what is forecast here not only will happen inexorably, but is happening now. Are biologists going to ride along like chips on this current, following whatever paths we are led into by forces generated by or for consideration of other fields? Or are we going to set our goals, discover our problems in reaching them, and endeavor to solve those problems?

Defining Goals

If my "hard sell" technique hasn't worked by now it won't, so I'd better stop belaboring this point and get onto a more tenuous one; namely, what I mean by "goals."

Some of the areas that occurred to me in which goals might be developed are: First, the resources available to biology. By resources, I mean people, scientists and technicians. I mean facilities in which and with which to work and I mean finances. The manpower problem, especially as it relates to recruitment and training, is receiving a good deal of careful attention right now from the AIBS and I can refer you to the Exhibit here of the Biological Sciences Curriculum Study and the excellent AIBS Secondary School Biological Sciences Film Series. I strongly recommend you familiarize yourselves with the thought and effort going into this field if you are not already enthusiastically apprised of it.

The second aspect of resources, the facilities problem, is in a less happy state. There was circulated about two years ago a report of the National Science Foundation on Federal Financial Support of Physical Facilities and Major Equipment for the Conduct of Scientific Research.

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* A speech delivered at the Annual Meeting of Biological Societies, The Pennsylvania State University, University Park, August 31, 1959.

In this report seven particular types of facilities in the biological sciences, either new or existing ones in need of new construction or support, were listed alongside seven from the physical and engineering sciences.

At the present time I know of no single case of one of the biologically oriented facilities requirements having been satisfied since the time of the report. On the other hand, in the case of the physical and engineering sciences recommendations, several have been consummated and in every other case at least one active specific proposal is being considered by a high level of government.

I doubt seriously that the people who prepared this list of needed biological facilities feel that their report exhausted the possibilities for thoughtful consideration of this problem. They would probably agree that the concerted consideration of biologists resulting in some specific proposals would be worthwhile and more likely to produce results.

This latter topic lapped over somewhat into the third aspect of resources—the finances.

I believe rather than to regale you with data on the subject, which is as available to you as it is to me, I will refer you to the studies being made periodically by the NSF and to your own clear expression a few minutes ago that research finances are a matter of concern.

The Content of Research

The second major topic which I suggest as a candidate for goal-seeking is content. I am audacious enough to suggest a reassessment of the content of our research and teaching because I believe we need a better framework of theory with which to explain to others and to see ourselves the interrelationships between our highly specialized and particular fields of interest. For my own use I have come to a type of theoretical conceptualization of biology which I advance here in the hope that it may stir better minds to criticism and formulation of a useful general theory of that part of science which is unique to biology.

In addition to the theories of physical science which we largely accept as relevant to biological matter there are at least three well formed concepts unique to biology. One of these is the principle of *Homeostasis*, another the theory of *Genetics* and the third the theory of *Evolution*. Most of what we study in biology seems to me to be a refinement of these three concepts or their application to practical problems.

The principle of homeostasis, which could be stated to be the quality of living organisms to maintain constancy of function in the presence of a changing environment, forms the basis for most of our studies in physiology and the field from which a majority of applications are derived in medicine and agriculture. I was interested to find a section heading "Homeostasis in Ecosystems" in Eugene Odum's book *Fundamentals of Ecology* which indicates the fruitfulness of generalization from the original physiological orientation of the concept of homeostasis.

I look on the theory of genetics as a concept of the way in which characteristics of organisms or cells can be maintained from one generation to the next and also of how variation can occur. It is rapidly growing bridges both into the area of homeostasis and evolution, as the genetics of cells as well as of organisms comes under more intensive attack.

The theory of evolution has also been undergoing refinement. It appears that without intervention of natural barriers, any species will tend to migrate into and fully populate any environment in which it can survive. In so doing it will tend to optimize those of its attributes which contribute to survival and allow to atrophy those which do not. The process obviously utilizes both homeostatic devices of the individual and genetic mechanisms of the race, so that the circle of theory here is closed. One intriguing aspect of this is the fact that in evolutionary adaptation to environment, species produce highly developed mechanisms for meeting particular environmental problems. These forms then constitute wonderful living models for the comparative physiologist to elucidate general properties of living organisms. Such things as the water balance in desert rodents and oceanic birds, the orientation devices of insects and migratory fish and birds, are a few well known cases in point.

As I indicated before, I apologize for the sketchiness of this brief treatment of theory—and also for the inadequacy of my definitions. It is given only to demonstrate the need for a thorough treatment of the subject and the possibility of starting with the framework we already have become used to.

The Essential Goal

The last goal I should like to urge for consideration is that of an "esprit de corps" or group feeling among biologists. This, it seems to me, is the most essential goal of all, for without it our efforts toward the others are bound to fail.

Only this morning I heard biologists referred to as a group of people with a collective inferiority complex. In the same breath it was pointed out that this is paradoxical since there seems to be some agreement—especially among physical scientists—that biology is *the* large field of promise for the future. This paradox must mean that biologists feel inadequate to meet this challenge. I am sure they are, when splintered into many factions. But I feel equally sure that we can be ready to meet the bright future of the study of life if we will pool our intellectual resources and our individual areas of self-confidence so as to develop a group confidence that will permit us to meet our responsibility in a democratic community and make an impact on the formation of public policy, with respect to the future of biology.

COVER PHOTOS

The *Bulletin* staff is interested in obtaining good photographs of unusual biological material that might be suitable for use on the cover. All such photos should be submitted as glossy prints, of reasonable size, with fine detail. An accompanying note about the subject is requested. The shape of the available cover space should be taken into consideration. Photos used will receive acknowledgments on the masthead page.

Notes on a Visit to Leningrad and Moscow

HENRY N. ANDREWS, JR., *The Henry Shaw School of Botany, Washington University*

DURING the past three years I have received a considerable amount of literature from paleobotanical colleagues in the USSR, particularly from Leningrad and Moscow. Because I planned to spend several months in Europe during the summer of 1958 it seemed an opportune time to try to arrange at least a short side-trip to those two cities. I was motivated by a desire to become personally acquainted with some of the Russian botanists, to have an opportunity to see some of their collections, laboratories and working conditions in general, and finally, by the usual curiosity about the country itself. My visit of ten days was so short a time that I could expect to learn only a little. Nevertheless, I have never received so much education in a similar period and my purpose in submitting these brief notes is twofold: to pass along some of my interesting experiences and to encourage other American botanists to visit the USSR.

My brief experience may be taken for whatever it is worth, but I am certain that a greater exchange of botanists between the USA and USSR can have only beneficial results.

I would emphasize at the outset that the cordiality and hospitality one can expect in Leningrad and Moscow are of the very finest and quite obviously genuine. In ten days I did not experience the slightest animosity from anyone, and my impression was that the Russians, botanists and laymen alike, are as anxious to learn more about us as we are to learn about them. Much that follows is of a nonbiological nature but I have included it hoping that it would interest and encourage potential American biologist-visitors to the USSR.

The Visit Begins

My journey really began at 5:30 on October 15 when I boarded a Russian plane at the Helsinki airport. It was not a new plane, the night was dark and rainy, no announcements were made en route as is usual on other airlines, and the dinner consisted of a glass of tea, three small cookies and a still smaller green apple. However, the stewardess, who spoke good English, was cordial and we arrived without incident at the Leningrad airport about an hour and a half later. The airport building is apparently rather new but built along what might be termed Victorian lines—quite different from airport construction in any other European city that I have visited. During the course of an hour our passports were carefully examined but little or no interest was taken in our baggage and the "Intourist" agent eventually got us all into taxis and headed toward the Astoria Hotel.

When the Intourist office opened at 10 the next morning I was assigned my guide-interpreter and we sat down to plan my 5-day visit in Leningrad. Everyone employed in this office was most pleasant and helpful during my stay there. The staff's knowledge of languages is remarkable; my own interpreter spoke flawless English and in the hotel dining room many of the waiters knew at least one language other than their own—English, French and German were the most frequent. The menu is printed in Russian, English, German, French and Chinese so that there is no problem in dining. With no knowledge of Russian one can get along with the aid of an interpreter, but it would be a great advantage to know some as a means of communication, and the people would genuinely appreciate a visitor who would take the trouble to learn at least a little. I encountered several botanists in both Leningrad and Moscow who spoke good French and I found some knowledge of that language a distinct advantage.

One other introductory comment will perhaps be of interest since many have asked me about the cost involved. During the summer months the "deluxe" Intourist rate is approximately $30 per day but at the time of my visit it was $25.50. This seems high but it includes a room with private bath, four meals a day with a generous food allowance, the full-time service of a guide-interpreter and up to three hours use each day of a private automobile with driver. Although one may call upon the service of the guide-interpreter for the whole day this is not obligatory. So far as I could determine a visitor is quite free to wander about Leningrad and Moscow, day or night. I encountered no restrictions on the use of my camera other than the weather which was phenomenally bad the whole time.

A Visit to the Komarov Botanical Institute

I first requested my guide to contact the Institute where I had friends through previous correspondence, and we were invited to go there immediately. It is about a ten minute drive from the hotel and we were met at the door by a welcoming committee of six botanists. We were then led to a reception room where about 18 staff members were gathered. I felt like a very "distinguished" guest indeed. Fortunately, this formality did not last long and about 10 of the group asked me to go to one of the laboratories where we gathered around a table. The leader of the group, Antonina I. Turutanova-Ketova, introduced me to those present and I learned something of their fields of interest and current work and had the pleasure of meeting those with whom I had been in correspondence. My only disappointment was in finding that Prof. Armen Takhtajan was on an excursion to China.

After some introductory discussion I was asked to tell them about my own work. To assist in such situations and also to serve as a sort of calling-card I had with me several sets of "peel" preparations of our American Carboniferous coal-ball plants. I took out a set, spread them out and began talking about some of the more interesting plants that we have worked with in recent years. This removed the last vestiges of formality and began a very lively conversation. Although Miss Snigirevskaya might be considered the only specialist in this area, they all displayed intense interest and I found myself completely at ease. Since the scientific names were known to many of them, and I was able to guess at a few of the Russian words, I found myself occasionally answering their questions directly while my interpreter handled, in most efficient fashion, several questions at a time from others. Two or three of the botanists present spoke some English.

They were obviously delighted and most appreciative when I informed them that I intended to present them with two sets of the peel preparations. In return I ended up with a vast pile of publications as well as specimens and photos that I had requested. They are certainly hungry for information and outside contacts, and I took the liberty of supplying several of them with addresses of American paleobotanists whom I thought might be able to help them in one way or another. During the remainder of my stay at the Komarov I talked with individual paleobotanists; in particular the following:

Miss N. Snigirevskaya who is working with coal ball plants from the Donetz. Many of her preparations show excellent preservation, comparing favorably with the best European and American coal ball plants. She is quite young and is in the initial stages of her studies but she impressed me as being very competent and I am sure will bring to light some new and interesting plants. I saw a young calamite stem with well-preserved leaves that I suspect is a new species; a large megaspore with a beautifully preserved gametophyte inside; sporangia with a strongly developed annulus that perhaps represent a new Coenopterid, and so on.

Pavel I. Dorofeev showed me his collections of Quaternary, Oligocene and even some Jurassic seeds and fruits. They are mostly specimens obtained by washing clays and other sediments; many fine speci-

mens gave promise of highly significant lines of research.

Valentina A. Samylina showed me an exceptionally diverse and interesting Cretaceous flora from close to the Arctic circle.

Antonina I. Turutanova-Ketiva has large collections of Jurassic plants in the process of being studied; some fine compression specimens and certainly many new plants.

THE paleobotanists that I met at the Komarov impressed me for the most part as being very competent and extremely hard-working. Space is a problem; they are working under very crowded conditions. But the enthusiasm and general spirit seemed good. They are most appreciative of any aid that is offered and they were exceptionally hospitable. When I first arrived I had no real idea as to how long a visit I might pay them but it soon became apparent that a couple days would be a minimum. Rather than have me go back to the hotel for lunch they served a fine meal, complete with caviar, in one of the offices so that we could continue our discussions without interruption. I gained the impression that they have difficulty in obtaining all the foreign literature they need and that publication of their own work does not go as fast as they would like. It is all too evident, however, that they read our literature much more carefully than we read theirs. I left them with the promise that I would encourage my American colleagues to prepare Russian summaries of their papers and with the hope that they would be able to reciprocate.

Other Aspects of Leningrad

Although the personal contacts I was able to make with Russian botanists were particularly pleasant and profitable I consider my visit to the "Palace of Young Pioneers" in Leningrad by far the most significant. Anyone interested in American education, or, indeed in the future welfare of our country, must become acquainted with this program. As the name indicates this was one of the Tsar's many palaces now devoted to a huge recreation-work-study program for children. It is voluntary and is an after-school activity. I visited it about four o'clock one afternoon with two other Americans and will list a few of the activities we saw:

A recreation room with a wide variety of the usual indoor games that children, roughly between the ages of 10 and 15, everywhere like to play. The staff here was as cordial as the people were elsewhere and we lingered to play a few of the games ourselves.

A small theater seating perhaps 100 or more people where the children stage their own productions.

A chess club where about 40 children ranging in age from 12 to 15 years were playing under the guidance of two instructors.

In another room a woman was reading to about 15 children who aspired to be writers. As we were leaving, one boy, about 13 years old, asked his teacher if he might speak to the visitors in English. His English was not perfect but he did know some and had the courage to give it a try. Everywhere here the children were genuinely polite. Whenever we entered a room they stood up, not stiffly or with urging, but rather with the casual and spontaneous dignity of well-mannered children.

We were then taken to a nearby building where the "technical division" was located and visited several wood- and metal-working shops where small groups of boys were working under the guidance of instructors. In one advanced wood-working class I noted that the machinery (lathes, circular saws, etc.) were real factory machines; they were not working with children's equipment in any sense.

In brief, this appeared to be a large-scale (we were told that 2,000 children per day use the facilities here) and tremendously successful program for the maximum development of the skills of these children, and they were obviously enjoying every minute of it. Although the "Palace" has its own staff of instructors we were told that many others, such as university teachers, engineers and other professional people collaborate in the overall planning. I came away feeling that we will certainly lose the race if we are not willing to match this effort to give our children a comparable opportunity to develop their own skills. I might note that I observed no evidence that their children are in any way superior to ours. The projects they were engaged in are the kinds of things ours can do but the efficiency of their organization exceeds anything I know of in America. Assuming that this type of training is general throughout the USSR, a large advantage would accrue in a single generation.

A FEW other general notes on Leningrad may be of interest; it is strange and fabulous by comparison with other western cities. It is a city of palaces. It seemed that almost every building I pointed out to my guide proved to be a palace, large or small, built by some Tsar for his children, other relatives or friends. Largest and most magnificent of all is the Winter Palace, a tremendous structure of over 1,000 rooms, which now constitutes the main nucleus of the Hermitage Museum. In the course of an afternoon I wandered through several dozen rooms, lingering at exhibits that particularly interested me. The quantity of art exhibited is staggering, and so far as I could judge, it is all of the very best. Great painters are not represented by a few pictures but in most cases by at least an entire room.

In Leningrad, one is immediately impressed by the almost complete absence of private automobiles. Trucks are abundant and apparently reflect the amount of construction work underway, but private cars are conspicuous by their absence. Tremendous numbers of people use the underground transportation system or "Metro," as is it called, and a visit to this cannot be avoided. This is fantastic in that the underground stations are constructed of gleaming white marble and have crystal chandeliers. I complained to my guide that this was ridiculous, that the Leningradites had now resorted to building their palaces underground. I was told that there had been some criticism of this luxurious architecture and that the new stations under construction probably would not be as elaborate. The luxury of the Metro struck me particularly forcefully by contrast with the attire of the people using it. The people seemed adequately dressed for the weather, which was getting a bit sharp in mid-October, but their dress for the most part was dull and drab. There is no need for the word "fashion" in their vocabulary.

ON ANOTHER day I asked to be taken to the Tsar's Summer Palace. I had no real desire to see another of the innumerable palaces but thought I might be able to see something of the countryside. It is located along the shore of the Baltic—about a 40 minute drive by auto. After reaching the outskirts of Leningrad we passed through the 5 kilometers of no man's land that existed between the Russian and German lines during the war. It is significant to remember that Leningrad was besieged for 900 days and the Germans, although they never succeeded in entering the city, caused tremendous damage. Great efforts to rebuild on the part of the people have removed most of the evidence of wartime destruction.

Upon leaving the city behind I noted that, although the main road we drove on was paved, all of the side roads were dirt and extremely muddy. Many of the houses were of log, though good, construction. Later I saw many such houses in villages that I passed through on the train as we approached Moscow. Even on the outskirts of Moscow in certain districts many log houses are to be seen; in places these present a curious contrast with modern apartment buildings a few feet away. The log houses, the drab dress of the people and the abundance of soldiers seen on the streets suggest strongly that much of the national effort is going into something other than the general welfare of the people as we would understand it.

I VISITED the Kirov Theater in Leningrad on two occasions and saw Tchaikovsky's "Sleeping Beauty" and the Opera "Prince Igor". Both were magnificent performances and quite inexpensive. We sat in the Romanoffs' former private box for the Tchaikovsky performance for about $2.50. The acting was fine, the costumes lovely and the stage settings most effective. They seem to have a particular flare for dramatic endings; at the close of the first act of "Prince Igor" four large horses came charging across the stage and I was

glad that a wide orchestra pit separated me from the stage!

A short time ago I heard a recent visitor to Russia report that the people do not smile; I did not find this to be so. In so far as I could see the morale of the people seemed to be good. They are hard-working people and its shows on their faces, but they do smile and laugh, although there is not generally the gaiety that one finds in western European and American peoples. I think one can be misled by their drab clothing, the lack of color, and perhaps also by the dreary weather. I must add, however, that when I arrived back in Stockholm on a clear, sunny day it was like walking into paradise.

Moscow

I spent an exceptionally interesting and profitable day at the Geological Institute, Academy of Sciences, USSR and received the same abundant generosity and fine hospitality that I had encountered in Leningrad. I talked at some length with Maria F. Neuburg who has many new and interesting Upper Carboniferous and Permian plants. Her Permian mosses were particularly exciting and she presented me with a few specimens. In the course of our discussions I mentioned that I was gathering material for a textbook on paleobotany and she expressed the hope that Russian fossil plants would appear more conspicuously than has been the case with most recent books. Upon requesting a dozen or so photos from her publications for use in the book she assured me that copies would be sent along. Mrs. Neuburg speaks some English and impressed me as being an especially competent scientist.

Here again, they are working in very crowded quarters but much construction work was under way; at the time of my visit there was no heat in the building (because of repairs and construction) but it did not seem to be hindering the activity of the botanists. I heard some complaints of delay in publication but the spirit in general seemed good. Dr. V. M. Maslov, who speaks excellent French, showed me some of the plants he is working with and I had opportunity to see a few of Sofia N. Naumova's spore preparations; she informed me that she is finding abundant spores in Cambrian and Ordovician horizons. The Institute has its own excellent interpreter and during lunch the conversation was an excited and gay mixture of Russian, French and English.

Moscow appeared to me to be a big modern city where a tremendous amount of building is going on. It is an obvious show place for tourists from all over the world. Aside from the Kremlin it seemed to have little to offer that compared with the unique charm of Leningrad. I stayed at the National Hotel which lies across the street from one side of the Kremlin and from the dining room there is a magnificent view up Red Square to the fantastic and fabulous St. Basil's Cathedral. With its colorful twisted "spires" it is certainly unique in the western world and although it is one of the most intriguing structures I have ever seen I am still undecided as to whether it should be termed beautiful.

The Kremlin and the University

A visit to the Kremlin is, of course, a must. It covers some 60 acres although it gave the impression of being much larger; surrounded by a brick wall some 15 meters high and standing well above the river the whole structure presents a very impressive sight. One is not taken into the government building, but an ex-palace with incredible art collections and several ex-churches are points of great interest.

Moscow State University is a stock-in-trade tourist attraction. It is a massive single cluster of buildings, the front going up some 22 stories. It gave the impression of the Empire State building flanked by somewhat smaller structures. It contains some magnificent marble corridors which are certainly quite unnecessary and some very lush lecture halls. I visited the swimming pool, saw a few gym classes in progress, a small natural history museum, some smaller class rooms and had a look at one of the dormitory units. I do not feel that I spent enough time there to be a competent critic but I am most thankful that we are not given to this kind of university architecture. It is obviously a fine physical plant and accommodates some 23,000 students but I have some doubts as to whether it is as large as or better equipped than many of our leading universities.

IT MAY be appropriate to add a couple of incidents which lend a touch of humor and perhaps also reflect something of the feeling of the people.

One night at dinner a gentleman came to my table and motioned that he would like to sit with me. I gradually absorbed the idea that he came from somewhere in central Asia and I took out a "Scripto" pencil, sketched a rough map of the U.S., and indicated St. Louis. However, it was evident that he was not as much interested in my origin as he was in the pencil. (Other Americans had informed me that they encountered many children who wanted to exchange souvenirs; I did not have this experience.) My dinner companion took a pen out of his pocket and indicated that he would like to exchange it for the pencil. I did not feel happy about this because I felt I was getting the better of the bargain. To appease my conscience I went to my room where I fortunately had a small box of extra leads for the pencil and upon presenting this to him he seemed particularly pleased. I have used his Russian pen a good deal and it writes very well!

The second incident I believe reflects the hospitality of the people and their desire to know more of what is going on outside, but it proved to be almost a little too much of a good thing. My last night in Moscow, a Russian Air Corps officer came to my table and motioned that he would like to sit with me. I had a small decanter of port wine and he indicated that he would like some and made signs which I (all too correctly) interpreted to mean that he would return the favor. Fortunately my own dinner soon arrived and I consumed it. The waitress then brought on a large decanter of vodka and two large orders of caviar which the officer had ordered. The waitress, knowing some English, and apparently having a sense of humor, set the food and drink in front of us and said "Now, Comrades"! My new friend poured two glasses of vodka and dispatched his with haste; somewhat to my surprise I was able to do the same. A little later a second glass was disposed of. These were not small glasses and his friendliness increased as the minutes passed; after the third one we were holding hands and I began seriously to wonder where it would all lead to. Having some packing to do and having decided that it had gone far enough I managed to extricate myself, dodge around the table and out of the dining room.

WHATEVER the political problems between our two countries may be, I gained the distinct impression, as many other visitors have, that the Russian people are genuinely friendly and hospitable. The scientists I met were cordial and generous and I am sure are sincerely anxious for closer working relations with Americans. It is my hope that these brief and sketchy comments will induce other botanists from this country to visit the USSR and that we may serve as hosts to an increasing number of visiting Soviet botanists.

1960 ANNUAL AIBS MEETING

OKLAHOMA STATE UNIVERSITY
STILLWATER, OKLA.

August 28—September 1

The Controversy About Science Teaching

PAUL DEH. HURD, *Education Consultant, AIBS—Biological Sciences Curriculum Study*

THE current discussion of science teaching reflects the widespread concern about all of education. At the moment, the secondary school curriculum is the focus of attention. The debate in the public press has identified a plethora of problems and issues. Mostly, the rigorous reassessment of education has generated more confusion than direction for our schools. One consistent idea has emerged, however. That is: the "age of science" demands a program of education consistent with the times. An understanding of contemporary society and its course means understanding something of the nature of science and some intellectual command of its basic concepts.

"How can the teaching of science in elementary and secondary schools be improved?" has become a question for debate throughout the scientific community. Why has the high school program failed to motivate enough young people to become scientists? Are Russian teachers doing a better job of science teaching than American teachers? How can the science curriculum be modernized and brought up to date? How much emphasis should be given to technological applications in science courses? Why is science so poorly taught? How can "quality," "excellence," and "rigor" be restored in our schools? What is happening to the academically talented students? Questions about the shortage of science teachers, teacher status and salaries, high school teaching loads, and the adequacy of teaching resources and facilities are less frequently debated. These and other problems in science education must be resolved under the impact of 38,000,000 children and young people now in school and in a discipline where the fund of knowledge is increasing at an accelerated rate.

The urgency to bring about improvement in science teaching has stimulated the professional scientist to take an active part in curriculum reconstruction. The AIBS Committee on Education has established the Biological Sciences Curriculum Study to develop a coordinated program of biological education from the elementary school through graduate training. The primary target of the committee will be the course in high school biology. Other AIBS committees are working on the improvement of teaching materials and laboratory instruction. Programs for the education of the academically talented student and the training of biology teachers are to receive special attention.

The number of books, reports, conferences and speeches on science education increases with each passing week. A selected bibliography on the major problems and controversies has been prepared for those serving on AIBS Education Committees and others who might be interested. These references are biased in the direction of reports of conferences, symposia and publications which have stimulated widespread editorial comment. The publications are generally available in public or university libraries.

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Rickover, H. G. 1959. *Education and Freedom.* E. P. Dutton & Company, Inc., New York. 256 pp.

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Elbers, Gerald W. and Paul Duncan, Editors. 1959. *The Scientific Revolution —Challenge and Promise.* (Published in Cooperation with the President's Committee on Scientists and Engineers) Public Affairs Press, Washington, D. C. 280 pp.

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Brandwein, P. F. 1959. *The Gifted Student as Future Scientist.* Harcourt, Brace, New York. 107 pp.

Cole, Charles C., Jr. 1956. *Encouraging Scientific Talent.* College Entrance Examination Board, New York. 259 pp.

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Donaldson, Robert R., Chairman. 1959. *Science for the Academically Talented Student in the Secondary School.* (Report of conference sponsored by the NEA Project on Academically Talented Student and the National Science Teachers Association, Washington, D. C. 63 pp.

Soviet Education:

DeWitt, Nicholas. 1955. *Soviet Professional Manpower, It's Education, Training and Supply.* National Science Foundation, U. S. Government Printing Office, Washington, D. C. 400 pp.

Hechinger, Fred M. 1959. *The Big Red Schoolhouse.* Doubleday & Company, Inc., New York. 240 pp.

Korol, Alexander G. 1959. *Soviet Education for Science and Technology.* Massachusetts Institute of Technology and John Wiley & Sons, New York. 513 pp.

Counts, George S. 1957. *The Challenge of Soviet Education.* McGraw-Hill Book Company, Inc., New York. 329 pp.

Science Education in Great Britain:

Perkins, W. H. 1958. *Science In Schools.* (Proceedings of a Conference under the auspices of the British Association for the Advancement of Science) Butterworths Scientific Publications, London. 150 pp.

Elementary School Science:

Blough, Glenn O., Chairman. 1958. *It's Time for Better Elementary School Science.* (Report of an Association Conference supported by the National Science Foundation). National Education Association, Washington, D. C. 48 pp.

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Choosing a Graduate School

T. M. SONNEBORN, *Department of Zoology, Indiana University*

ONCE a student has decided to undertake graduate work, by far the most important professional decision he will ever have to make is the choice of the institution in which he will carry on this work. To a degree which the college senior can rarely be expected to know, his whole future career is determined by his decision. His courses and contacts with professors and his associations with fellow-students strongly influence the scope of his grasp of his major and minor fields of study—what is already known, what is under active investigation, what further advances need to be made, what opportunities exist for making such advances. The same forces mold his critical perception, lead to the development of his own methods as teacher and researcher, and guide him to the choice of the major professor under whose supervision he will pursue his studies and researches for the Ph. D. degree.

IN MAKING the latter choice he is, in theory, free to transfer to a different institution or to decide upon a line of work different from the one he initially thought he would follow. Nevertheless, the intense interest and enthusiasm often possessed by his professors for their own specialties is likely to kindle in the student comparable interest and enthusiasm for one of these specialties. Moreover, a decision to remain at the institution in which he begins his graduate work is reinforced by social pressures and by reluctance on the part of the student to make a major move. These facts underline further the importance of making a wise initial choice.

THE impact of the major professor upon the student is likely to be long lasting. Experience shows that the professor tends to channel the student's interests and efforts for life, or at the very least to color them strongly; he is responsible to a preponderant degree for the direction, extent and quality of the student's training, knowledge, understanding, skill in research, and standards of work. This influence, particularly with regard to choice of problems for investigation, often extends far beyond the student days. For these reasons, it is of the utmost importance for the prospective graduate student to be well informed of the considerations relevant to a wise choice of institution and of major professor.

Sound Decisions

AT THE present time prospective graduate students too often make their decisions for reasons that may be unsound. Without due consideration, they may follow the line of least resistance and remain at the university from which they graduated; or go to a university simply because some relative, friend or mentor went there; they may accept the first assistantship or fellowship offered; or accept the one offering the largest stipend, irrespective of other advantages; or select a university only because of its general reputation.

A PREVALENT misconception on the part of a prospective student is the impression that his chances for admission to graduate work will be strongly limited by the size, location, or general status of the college or university at which he did his undergraduate work. To some extent this is true, but to a much smaller extent than the student may suspect. Far more important is the record the student has made in his college work, particularly in the fields of his interest and in related fields, the character of the recommendations by his professors, and the general indications of promise for high quality performance in graduate work. Among the more important indications are good grades; but drive, intensity of interest, and superior intellectual ability are even more indicative. A high quality student from any college can expect to get serious consideration of his application for admission to any graduate school. In general, lower quality students will be more likely to obtain admission at lower quality graduate schools. The quality of the student is the important thing, not the size, location or general status of his college.

FROM the financial point of view, the prospective graduate student is today in a commanding position. The number of graduate fellowships and teaching assistantships is already large and is rapidly increasing. These local resources are greatly supplemented by national sources such as the National Science Foundation and the National Institutes of Health. The student should be careful to note the amount available for his living expenses after other requirements are met, for often the student must pay tuition and other costs out of his stipend and these as well as living expenses vary greatly from university to university. Consequently, it often happens that a student with a Fellowship of lesser amount ends up with more "in pocket" because of lower tuition and other charges. In sum, financial need should no longer be decisive in the choice of a graduate school, for a high quality student will be likely to win adequate financial support at any high quality graduate school he chooses.

Reputation and Change

THE general reputation of a university for high quality scholarship is of course an important basis for choice. As a rule, no great mistake is made by electing to go to a university with a long and great reputation. On the other hand, this basis of choice is of limited value for several reasons. First, universities have their ups and downs and their popular reputations lag long behind the facts on which they are based: a university that has achieved substantial greatness does not acquire popular recognition of this achievement until much later; a university which has slipped from greatness to a lower status lives on its previously acquired popular reputation long after it has ceased to be deserved. Second, in general the different departments within a university—even the best—are of very unequal stature. A university with a great general reputation, even among scholars, is apt to contain some departments which are relatively weak; and a university with but a mediocre general reputation may contain some outstanding departments. It is therefore wise for the student to become informed of the reputation among competent scholars of the department of his special interest and to lay much more stress upon this than upon popular opinion or the reputation among scholars of the university as a whole. Third, the many-sidedness of modern biology has resulted in the virtual impossibility of having every aspect of it represented with equally high distinction at any one university. This means therefore that a given university, with a Biology Department (or several Biological Departments) having a deservedly great reputation, may not be outstanding at all in the field of Biology in which the prospective student is most interested. It is a great tragedy that students are too often misled by their ignorance of this fact and find to their disappointment that a highly and justly recommended department to which they have gone lacks precisely the high quality leadership in the area of their main interest. It is thus important for the student to try to discover where the outstanding representatives of his special interest are to be found. Fourth, the prospective student should be informed that these are days of rapid changes in the faculty of universities; within a matter of a few years a galaxy of top faculty in one area and in one department may disperse to other institutions or an institution previously weak in a particular area may acquire within a few years a group of top rank scholars in that area. The student thus needs to know the current situation, not merely what prevailed some years ago.

HOW can the prospective student discover the most important facts upon which to base his choice of a graduate school? Until recently, there was little opportunity for him to acquire these facts and he was dependent upon chance or the advice of others who were more or less informed. A marked change in the situation, however, is now in progress. More and more, centers of advanced work are realizing their obligation to present to prospective students the information that will permit them to make intelligent decisions.

The AIBS After Ten Years

HIDEN T. COX
Executive Director, AIBS

Those of us directly concerned with the AIBS are often asked the question, "What does the AIBS do?" The following condensed version of the Executive Director's annual report to the Governing Board answers that question to a certain extent. While it was prepared in August, this report, in effect, outlines the activities of the Institute at the end of its first decade.

THE AIBS now represents an estimated total of 80,000 biologists. It is no smaller than second in size among the independent scientific societies and in all likelihood is the largest. Its annual gross income from all sources is fast approaching thirty times that projected for 1955, its first year of operation without the financial backing of the National Academy of Sciences. The staff has tripled in size and there are AIBS employees in two offices in Washington, D. C., and offices in Baltimore, Maryland; Boulder, Colorado, and Kansas City, Missouri. The AIBS is in the forefront among its sister societies in educational programs, in the development of improved communications among scientists, in experimental publications projects, and in the development of foreign language translation programs. The Institute's prestige is growing steadily and there is hardly a significant group concerned with scientific matters which does not invite AIBS representation.

A great many people are responsible for the growth of the AIBS. Credit in large measure is due the officers, the Executive Committee, the Governing Board, our friends in government agencies and private foundations, and the thousands of biologists who support the Institute day by day. A significant share of the credit must go to the staff members, who have given devoted and diligent service to the Institute far beyond what normally could be expected of them.

A. Educational Activities

Many valuable projects have been developed within our Committee on Education and Professional Recruitment. All of the following programs were initiated within this committee under the able chairmanship, since 1955, of Dr. Oswald Tippo of Yale University.

1. *The Biological Science Curriculum Study*

This far-reaching project actually started on January 15, 1959. Dr. Arnold Grobman, taking leave of absence from his permanent position as Director of the Florida State Museum, established headquarters for the BSCS at the University of Colorado, in Boulder. As director of this project, he has acquired an efficient staff and plans for the Curriculum Study are proceeding according to schedule.

The Steering Committee of the BSCS, under chairmanship of Dr. Bentley Glass, is composed of some twenty-five leading scholars from many fields of biology and from various levels of the educational system. Two meetings of the Steering Committee have been held since January, and there have been a number of meetings of this group's executive committee. As its first major objective the Steering Committee outlined the development of a modern, fresh approach to the teaching of biology at the tenth grade level. Future plans call for an examination of biology units or courses at lower levels and, finally, at the college and university levels. Dr. Grobman has employed consultants in certain specialized fields to work with him on specific problems suggested by the Steering Committee. A group concerned with innovations in laboratory instruction met last summer in Boulder, and developed a number of new approaches to the presentation of high school laboratory work. A set of full-scale writing conferences is scheduled for the summer of 1960 in Boulder. In the meantime, Dr. Grobman, Dr. Glass, and other members of the Steering Committee have been indefatigable in giving their time to present the BSCS story to interested groups all over the country. The BSCS staff has prepared a brochure describing the aims and objectives of the Study and is issuing periodic newsletters reporting upon its progress.

A renewal grant has been made by the National Science Foundation to continue activities of the BSCS through October 1, 1960.

2. *Secondary School Biological Sciences Film Series*

This project, with principal support from the Ford Foundation, began in October, 1958. A Steering Committee, under the chairmanship of Dr. Oswald Tippo, selected Dr. H. Burr Roney as principal teacher and director of the project. It further outlined the major units that should comprise this tenth grade course. These units, based upon modern biological concepts, have subsequently been expanded and developed by small working committees of specialists. About 100 of the most able biologists in the country have contributed to the design of the course. The full course is now in outline form, and individual scripts for the basic 120 films are being written. The first group of actual filmed lessons has been completed.

A group of over 100 of the best-qualified teachers from all sections of the country has agreed to serve as evaluators of the films as they are produced. A contract has been entered into between the AIBS and the McGraw-Hill Book Company for production of the films and for publication of the accompanying student's guide and teachers' manual.

3. *Visiting Lecturers' Programs*

a. The College Visiting Lecturers' Program, supported by the National Science Foundation and the Atomic Energy Commission, continues to grow both in size and prestige. In the past year the number of visits to small college campuses has increased by 100%, and there was an increase of 40% in the number of participating speakers. A brochure describing this and other Visiting Lecturers' Programs has been distributed to about 2,000 schools.

b. High School Visiting Lecturers' Program. The success of the college program led us to request from the National Science Foundation support for a similar program at the high school level. A grant for this has been made, and we are moving ahead with our plans to initiate it in the fall of 1959. At present 40 speakers have accepted our invitation to participate in the program and, with little publicity as yet, there have been a surprising number of inquiries.

c. MEND Program. Under a grant from the Atomic Energy Commission, we are supplying speakers, primarily in the field of radiation biology, to medical schools. Although the program was not started until March 1 of this year, there have already been twenty-six visits. As the program gains momentum, there is every reason to expect much greater participation.

d. Foreign Visiting Lecturers. AIBS has submitted a proposal to the National Science Foundation to support a program by means of which the AIBS can sponsor visits of outstanding foreign biologists to this country for lecture tours to various research centers. Each tour probably will last about a month, and the amount of support requested for the first year's opera-

tion will permit sponsorship of about 25 such visits.

4. Career Information

Although personnel and time are limited, the AIBS has been handling a great many personal, written, and telephone inquiries concerning career guidance. An average of twenty requests a week are received from high school students, vocational guidance people, librarians, private organizations, etc. A file has been compiled of the available career guidance literature in all major biological disciplines. There is now a proposal before the National Science Foundation for support of the writing of a career guidance brochure. In the opinion of the Education Committee, this brochure should concern itself with the entire field of biology rather than with individual disciplines within the field. It should be free to all interested high school students and advisors. Tentative acceptance has been received from an unusually capable man to write the text of the brochure. He will be assisted by three high school teachers.

B. Publications

Our publications projects are initiated from a variety of sources: established editorial boards, the AIBS Publications Committee, cooperative efforts between the AIBS and various biological societies, and the newly established Foreign Translations Committee of the AIBS.

1. Wildlife Disease Journal

Probably the most interesting undertaking in the publications area has been the establishment of the *Wildlife Disease Journal*, a cooperative effort between the AIBS and the Wildlife Disease Association. The text of this quarterly journal appears entirely on microcards. Each issue consists of four articles, one to a microcard. The typed and edited manuscript is photographed directly upon the microcard, and each paper can run to about forty-seven pages. Each issue of four cards is accompanied by a conventially printed leaflet with a digest of each article. One issue has been published and has met with considerable interest. This experimental project is being supported jointly by the National Science Foundation and the Council on Library Resources, Inc. It provides not only the majority of financial support for publication of the *Journal*, but also supplies hand viewers to bona fide members of the Association. A greatly improved hand viewer is now being developed.

2. AIBS Bulletin

The last two issues of the *Bulletin* have been innovations. The April issue was devoted entirely to articles concerning the developing AIBS educational projects reported in Section A above. The June issue contained a lead article by a prominent and sometimes controversial figure in the literary world. The program issue, although strictly speaking not a part of the *Bulletin* series, was printed in a different manner this year. Composition of the Society program sections was done by typewriter in the AIBS office, and these portions were printed by offset. A considerable saving in printing cost has thus been made. It seems feasible for the *Bulletin* to add one issue per year, thus making a total of five regular issues. The anticipated increase in advertising should all but defray the added expense of the extra issue.

3. The Quarterly Review of Biology

Edited by Dr. Bentley Glass, the QRB continues to maintain its high level of excellence and is, without question, a source of prestige for the AIBS. The number of subscriptions has increased moderately since August of 1958 and the increased revenue will permit Dr. Glass to return to the number of pages carried by the Review in past years.

4. Translations of Soviet Biological Journals

Six journals are now being translated, edited and published by the Consultants' Bureau of New York City under contract with the AIBS. The entire program is subsidized by a series of grants from the National Science Foundation. The Consultants' Bureau is rapidly reducing its lag between date of original issue and date of issue of translated editions. A seventh Soviet journal was started within the past year by the AIBS. This journal—*Soviet Soil Science*—is being handled entirely by the AIBS office. Contracts are made between the AIBS and individual translators, compositors, and printing houses. Unlike the Consultants' Bureau efforts, the AIBS-sponsored *Soviet Soil Science* is printed in letter-press. The first issue has been published, and the time lag is rapidly being decreased. The obvious quality of the *Soviet Soil Science* translation edition is something of which to be proud.

In addition to translation of periodicals, significant Russian monographs are being translated and published. Two of these have been published, and five more are in various stages of production.

Dr. Egbert Walker, under contract with the AIBS, is preparing a supplement to the bibliography of East Asiatic Botany. This project, too, is supported by the National Science Foundation. During the past year, Dr. Walker made a trip to Japan to arrange collaboration with Japanese botanists and bibliographers. There is good reason to believe that this project will be completed by July of 1960.

5. Symposium Series

Sales of volumes of AIBS symposium proceedings continue to be slow. There will be more intensive promotion and it is hoped that sales will become more brisk. Proceedings of the *Conference on Animal Sounds* and on *Basic Biological Aspects of Aging* are now being edited and should be published by spring of 1960.

6. Central Publications Office for Biological Journals

The National Science Foundation has made a grant for support of a study of the costs that may be encountered in setting up such a joint endeavor. In the meantime, redactory services have begun for one publication of the Entomological Society of America and one of the Phi Sigma Society. This could become a nucleus around which is organized a long-anticipated central editorial and business management office.

C. Advisory Committees, Conferences and Symposia

These activities, by and large, are supported by contracts or grants from the Office of Naval Research, the National Science Foundation, the Atomic Energy Commission and the National Institutes of Health.

1. Advisory Committees

Nineteen advisory committee meetings to several federal agencies have been held during the past year. These committees not only advise the appropriate agencies in policy matters concerning the distribution of research funds assigned them, but also evaluate specific research proposals and offer advice as to their scientific merit. Approximately 238 proposals were reviewed by these committees in their various activities.

2. Conferences

Five conferences were sponsored by the AIBS in cooperation with various federal agencies. An example was a Conference on the Differences and the Similarities between Physiological Aging and Radiological Life Shortening arranged by the AIBS for the National Institutes of Health and the Atomic Energy Commission.

3. Symposia

The AIBS has co-sponsored with federal agencies three major symposia during the year. A typical one was the First International Symposium on Submarine and Space Medicine held last September at New London, Connecticut, sponsored jointly by the Advanced Research Projects Agency and the AIBS.

4. Consultants

The AIBS arranges for individual biologists to serve as consultants to federal agencies. During the last year, thirty-five consultants have thus been provided for the Atomic Energy Commission and twenty-one for the Office of Naval Research.

D. International Cooperation

Although the AIBS is a national organization, it is finding itself in increasingly closer contact with international organizations and groups of foreign biologists. This is an across-the-board development and peculiar to no single activity of the Institute. Certain examples may be cited as follows:

1. Because of our burgeoning translation program, the AIBS, with support from the National Science Foundation.

sent Dr. Fred R. Cagle, a member of the Board of Governors, to the Soviet Union, India, Hong Kong and Japan last summer and fall. Dr. Cagle has been of invaluable assistance in the development of our Soviet translation programs as well as in our as yet embryonic plans for translation programs in other exotic languages.

2. We continue to assist United States biologists to attend foreign meetings and congresses. Travel grants have been arranged through the National Science Foundation and the Office of Naval Research for participants to attend a Cytochemistry Symposium in Denmark and a Symposium on Genetic Control of Protein Specificity, also in Denmark. In addition, AIBS was instrumental in obtaining MATS transportation for six persons recommended by the American Society of Parasitologists to attend an International Conference on Tropical Medicine.

3. For the third year, AIBS has been able to obtain transportation from the Office of Naval Research for the principal speaker, always a prominent foreign microbiologist, at the annual meeting of the Society of American Bacteriologists.

4. Primarily through the good offices of Dr. Frank Cullinan, Secretary-Treasurer of the AIBS, advice was given on the structure of AIBS to a group of British biologists forming a similar British organization.

5. AIBS has cooperated with the National Academy of Sciences-National Research Council in obtaining recommendations from AIBS societies for members to comprise the recently reconstituted U. S. National Committee of the International Union of Biological Sciences.

6. For the third year, AIBS is actively participating through Dr. T. C. Byerly, Dr. James G. Dickson, and myself in the meetings of the U. S. National Commission for UNESCO.

7. The Asia Foundation, San Francisco, California, has recently made a small grant to the AIBS. This grant will defray the total cost of three-year memberships for Asian biologists in the AIBS and defray expenses of Asian biology graduate students in this country to attend AIBS annual meetings.

E. Placement Service

During the last year, there has appeared one printed placement list with a total of 170 registrants. One of the most effective aspects of the Placement Service is that portion of it conducted during the AIBS annual meetings. At Indiana, there were 176 registrants for positions. Gratifyingly enough, there were over 100 employers who had representatives at the convention to interview these applicants. In addition, there were a number of other positions registered, although the companies did not have representatives there. Of course, the Placement Service as an activity does not approach the financial break-even point, but it is unquestionably rendering great service, particularly to young people just out of graduate school.

F. Annual Meetings of Biological Societies

The Indiana University meetings were by far the largest ever sponsored by the AIBS. Over 1500 papers were given in the sessions of the twenty-five cooperating societies. Paid registration reached an all-time high of just under 3900. A highlight of the meetings was the celebration of its golden jubilee by the American Phytopathological Society. A series of unusually interesting symposia on virology was sponsored by the APS with a number of foreign participants present. Most of these could attend because the AIBS was instrumental in obtaining travel grants for them. In addition, the societies sponsored a special exhibit in connection with the main exhibit hall.

G. Membership List Maintenance

An historical source of irritation between the AIBS and its Member Societies has been our maintenance of membership lists both for Member Societies and for use of the AIBS in distributing the *Bulletin*. The system used for maintaining these addressograph files is essentially the one that was established in 1950. The growth of the AIBS has reflected itself in the degree of efficiency with which society lists at current status have been maintained. The point was reached during the past year when it was felt advisable to revise procedures. Accordingly, the services of a professional management consultant firm were engaged. This firm, which has also provided auditing services and is well acquainted with the Institute, made an extensive analysis of the present system. The system itself, in their judgment, is sound and they recommended no major changes in it. They did recommend the application of certain precise controls over procedures, which controls have now been instituted. As of July 1st, the current membership list of each society has been checked by this management consultant firm against the deck maintained by the AIBS. Discrepancies thus uncovered have been analyzed and reconciled in AIBS records. As of August 15th, the records are current with society address changes within twenty-four hours after receipt of these changes. Steps have been taken to insure that this schedule will be maintained and that societies will be kept precisely informed of changes as they are made in the master list maintained by the AIBS. This study and the changes necessitated by it have involved a considerable expenditure of funds, but it is felt that the results in improved society relations will amply justify it.

H. National Register of Scientific and Technical Personnel

The National Science Foundation has been in process of evaluating the entire Register program, and the AIBS has therefore been engaged largely in routine maintenance of data for registrants. A continuation of the contract to support this activity has been received from the National Science Foundation. The level of financial support is somewhat higher than last year's, but not as high as had been requested to do the job that should be done. There will, then, be increased activity during the coming year but a number of the things we wanted to do will have to be deferred for at least another year.

I. Membership in the AIBS

On January 1, 1959, the Entomological Society of America became a full Member Society. As of that date, the Society of Phi Sigma also became a full Member. During the last several months, the American Academy of Microbiology has applied for and been granted by the Governing Board, full membership in the Institute.

This year also sees as new Affiliate members the American Society of Agronomy, The American Fisheries Society, the Wildlife Disease Association, The American Fern Society, the American Association of Bioanalysts, and the Association of Official Seed Analysts.

There are now forty-eight professional biological societies represented in the Institute. Only a few major uncommitted societies remain. It is estimated that the approximately 80,000 biologists who are members of AIBS societies represent roughly 85% of the professional biologists in this country. It is evident that the great majority of biologists look to the AIBS as their national organization. While this situation is most encouraging, the AIBS has a serious, almost frightening responsibility to represent professional biologists of this country in the effective and dignified manner that they have every right to expect.

J. Associates

In the past, lack of time and staff personnel have prevented the devotion of as much time and attention as the AIBS would have liked in the development of a program for commercial firms associated with the Institute. In the last several months, however, the Associates Committee, under chairmanship of Mr. William Keller, has met twice and there is renewed enthusiasm among members of the committee. It is hoped that gradually more commercial associates will be attracted to and participate more directly in the activities of the Institute.

K. Financial Status of the Institute

As predicted at the last meeting, the AIBS ended the calendar year 1958 with a small surplus. In addition, the deficit that had been run in the 1957 operations was made up. Therefore, for the four full years of AIBS independent operation up to the end of 1958, there is a cumulative surplus. A small surplus is predicted again for 1959.

Biological Programs at AAAS Chicago Meeting—

December 26—31, 1959

THE 126th Meeting of the American Association for the Advancement of Science will include sessions of 18 AAAS sections and of some 93 participating organizations. There will be annual meetings of the American Society of Naturalists, American Society of Plant Taxonomists, Beta Beta Beta, National Association of Biology Teachers, and Society of Systematic Zoology, and special meetings arranged by the Chicago Academy of Sciences, Ecological Society of America, and Mycological Society of America. Programs of particular interest to members of the AIBS are:

I. AAAS. General symposium, Moving Frontiers of Science IV with lectures on "How Life Began" by S. W. Fox, Dec. 26 eve. and "Genes, Viruses, and Cancer" by Wendell M. Stanley, Dec. 27 aft. AAAS Committee on Science and the Promotion of Human Welfare, a symposium on "Science and our Future," arranged by Barry Commoner, Dec. 27 morn. AAAS Presidential Address, "The Development of a Service Policy," by Wallace R. Brode, Dec. 28 eve. Smoker for all registrants, Dec. 30, eve.

II. AAAS Section C–Chemistry. Symposium, "Structure and Metabolism of Collagen," arranged by Jerome Gross, Dec. 28, morn. Speakers: Alexander Rich, Peter H. Von Hippel, Paul M. Gallop, David S. Jackson, Ohozo Mitoma, William B. Van Robertson, Jerome Gross, and Sidney Rothbard.

Other symposia deal with recent developments in organic chemistry, and high-energy radiation of proteins and amino acids.

III. AAAS Section F–Zoological Sciences. Contributed papers, Dec. 26, 27, 30; two-session symposium, jointly with Section G, "Unsolved Problems in Biology IV" (principally, the cell and genetics), arranged by Norman G. Anderson and Barry Commoner—speakers include David M. Prescott, David E. Green, Norman G. Anderson, Karl M. Wilbur, R. W. Briggs, R. A. Brink, David A. Nanney, and Barry Commoner, Dec. 28 and 29; two-session symposium, "The Impact of Electron Microscopy on Biology," jointly sponsored by the Argonne National Laboratory, arranged by E. L. Powers. Speakers: F. Wasserman, A. J. Dalton, Hans Ris, H. Fernandez-Moran, S. L. Palay, Charles F. Ehert, Leon Dmochoski, and Paul Weiss. Zoologists' Dinner and vice-presidential address by Herbert Friedmann, Dec. 29. Biologists' Smoker jointly with Section G and all biological societies, Dec. 29.

IV. AAAS Section G–Botanical Sciences. Cosponsorship of "Unsolved Problems in Biology IV", and Section O's five-session symposium on germ plasm; and Joint Botanists' Dinner with American Society of Plant Taxonomists; address by William C. Steere and vice presidential address by Frits W. Went, Dec. 29.

V. AAAS Section N–Medical Sciences, Gerontological Society, other cosponsors. Four-session symposium on "Aging: Facts and Theories," arranged by N. W. Shock, Dec. 29 and 30. Speakers:

A. Implications for Society—J. W. McConnell, J. T. Freeman, R. J. Havighurst, and Chauncey D. Leake;
B. Aging in Tissues and Cells—Bentley Glass, James Ebert, Geoffrey Bourne, and Abraham White;
C. The Integrated Organism—Milton Landowne, Gregory Pincus, Phillip Handler, and Ewald W. Busse;
D. Theories of Aging—Nathan W. Shock, Hans Selye, Bernard L. Strehler, James E. Birren, and Samuel E. Stumpf.

VI. AAAS Section O–Agriculture, Genetics Society of America, American Society for Horticultural Science, other cosponsors. Five-session symposium, "Germ Plasm Resources in Agriculture: Development and Protection," arranged by R. E. Hodgson, Dec. 28–31. Speakers:

A. Orgin of Germ plasm—C. O. Erlanson, J. R. Harlan, H. H. Stonaker, R. W. Phillips, Henry A. Wallace;
B. Additional Sources of Germ plasm—H. J. Sloan, F. P. Cullinan, M. G. Weiss, A. W. Nordskog, J. L. Lush, H. A. Rodenhiser;
C. Development Programs in Crops and Livestock—E. J. Warwick, H. J. Gorz, W. K. Smith, Gordon Dickerson, G. W. Burton, G. F. Sprague, L. N. Hazel, C. E. Terrill, N. D. Bayley, W. A. Craft, P. B. Zumbro, R. E. Comstock;
D. New Approaches to Plant and Animal Improvement—A. E. Bell, A. B. Chapman, M. R. Irwin, Quentin Jones, Ivan Wolf, R. S. Caldecott, R. I. Sailer, W. V. Lambert;
E. Perpetuation and Protection of Breeding Stocks—Roy Magruder, Edwin James, R. E. Larson, N. L. Van Demark, F. B. Hutt, T. C. Byerly.

SOCIETAL PROGRAMS

American Association of Clinical Chemists. Sessions for contributed papers, symposium on lipid metabolism arranged by Alvin Dubin, and dinner Dec. 26–27.

American Physiological Society. Two-session symposium on Space Medicine III, cosponsored by the American Astronautical Society, arranged by Fred A. Hitchcock, Dec. 28.

American Psychiatric Association. Four-session symposium, "The Roots of Behavior", arranged by Eugene L. Bliss, Dec. 28, 29.

American Society of Naturalists. Business meeting, presidential address by Paul B. Sears, and four-session symposium, "Interactions in Nature", cosponsored by the Ecological Society of America and the American Society of Limnology and Oceanography, arranged by Arthur D. Hasler, Dec. 27, 28. Speakers:

A. Population Ecology—Paul B. Sears, Thomas Burnett, Thomas Park;
B. Conversion of Energy—Basil Slobodkin, H. T. Odum, G. L. Clarke;
C. Nature of Adaptation in Plants—E. B. Kurtz, Jr., Calvin McMillan, J. T. Curtis;
D. Ecology of Behavior—T. H. Waterman, W. S. Hoar, Theodore Bullock.

American Society of Plant Taxonomists. National annual meeting, Dec. 28–30, including sessions for contributed papers, business meeting, and dinner.

Beta Beta Beta Honorary Biological Society. Biennial business meeting, lunch con and address by Bentley Glass, Dec. 28.

Chicago Academy of Sciences. Four-session symposium, "Physiology of Reproduction in Birds", arranged by Richard A. Edgren, Dec. 28, 29. Speakers: R. A. Edgren, Albert Wolfson, C. L. Ralph, A. V. Nalbandov, T. W. Harris, R. L. Watterson, Gregory Pincus, R. K. Meyer, M. A. Rao, R. L. Aspinall, F. K. Hilton, W. J. Beecher, D. L. Cook, F. B. Colton, F. C. McLean, A. M. Guhl, D. S. Lehrman, and L. B. Arey.

Ecological Society of America. Contributed papers in plant and animal ecology, Dec. 28, general ecology, Dec. 29, and two-session symposium, "Sand Dune

Systems," arranged by Jerry S. Olson, Dec. 30. Speakers:

A. Origin of Dune Landscapes, Jerry Olson, J. H. Bretz, H. T. V. Smith, David Simonett, R. S. Sigafoos, V. M. Laessle, W. S. Cooper;

B. Organization of Dune Committees, C. E. Olmsted, C. C. Laing, W. E. Martin, William Gillis, H. T. Odum.

Mycological Society of America. Symposium, "Classification of Fungus Groups of Debatable Affinity, Dec. 30, morn. and aft., arranged by Donald P. Rogers. Speakers: C. J. Alexopoulos, C. W. Hesseltine, G. W. Martin, J. S. Karling, R. W. Lichtwardt, R. F. Cain, J. W. Baxter, A. H. Smith.

National Association of Biology Teachers. National meeting Dec. 26–29.

National Speleological Society. Two-session symposium, "Speciation and Raciation in Cavernicoles", arranged by Thomas C. Barr, Jr., Dec. 28.

Society of Systematic Zoology. National annual meeting, Dec. 26–30, including sessions for contributed papers, business meeting and book lounge.

The AAAS Annual Exposition of Science and Industry (about 100 booths) and the **AAAS Science Theatre,** with recent foreign and domestic films, will be prominent features of the meeting. Coupons for sleeping accommodations and advance registration will be found in the advertising pages of *Science,* beginning July 24.

Across the Editor's Desk

• **T. C. Byerly, member of the AIBS Governing Board for the Poultry Science Association** represented AIBS at the fortieth meeting of the Executive Committee, U. S. National Commission for UNESCO held in Washington, August 24 and 25. Secretary of State Herter met with Dr. Byerly and 16 other members of the Executive Committee and assured them of the Department of State's firm support of UNESCO activities.

• **The National Science Foundation has announced a program of Summer Fellowships for Secondary School Teachers of Science and Mathematics.** Several hundred awards will be made for study beginning in the summer of 1960 and continuing for as many as three successive years. This is designed to encourage highly qualified secondary school teachers to improve their competence by working at the graduate level in these fields.

Fellowships will be awarded to support individually planned programs of study in the mathematical, physical and biological sciences acceptable toward an advanced degree in one of these sciences. Pursuit of a degree is not required, but study at that level is mandatory.

• **The National Academy of Sciences and the Academy of Sciences of the USSR** on July 9, 1959, signed a two-year agreement providing for exchange visits by research scientists of each country for periods up to one year. The agreement also provides for the organization by the two Academies of joint symposia dealing with scientific problems of current interest, mutual assistance in the exchange of scientific information, and for the exchange of invitations to important scientific meetings.

• **The National Academy of Sciences has announced the establishment of a new Office of Documentation** under the direction of Karl F. Heumann, formerly of Chemical Abstracts Service. The new office will have three major areas of interest: 1) advice to the National Science Foundation and others in broad problems of scientific documentation; 2) aiding U.S. scientists and documentalists in international activities relating to scientific documentation; 3) advice and assistance to the several activities of the Academy-Research Council in their many documentation problems.

• **The University of Pennsylvania, under a grant from the Rockefeller Foundation,** is constructing a new building for its Division of Biology and certain Medical School departments. The main purpose of the building will be to facilitate research collaboration between university groups in the biological fields. Some of the departments affected are: physiology, microbiology, experimental surgery and public health. In addition to the grant by the Rockefeller Foundation, funds are being provided for the new building by the University, the Longwood Foundation, the National Institutes of Health, and private donors.

• **The Marine Biological Laboratory at Woods Hole, Massachusetts** has received a grant of $100,000 from the Rockefeller Foundation. The grant will be used for general support of the Laboratory for a period of five years, particularly in the area of heavy maintenance and repair charges on the physical plant. This will facilitate the laboratory's efforts to continue the modernization of its buildings and equipment.

• **The National Science Foundation is continuing aid** through the current fiscal year of competent scientists in development of new equipment for science teaching. To date, the Foundation has supported 18 projects of various scientists who are devising new laboratory equipment for school and college courses. Proposals must be received by the Foundation by December 31, 1959. Further information may be obtained from the Course Content Improvement Section, National Science Foundation, Washington 25, D. C.

• **The Atomic Energy Commission has announced a new program** of Special Fellowships for Advanced Training in Health Physics. The Program offers five new fellowships per year, beginning with the academic year 1959–60, leading to the doctorate degree in radiation physics, chemistry, biology and engineering. Subject to approval, fellows may attend, full time, the graduate school of their choice to work upon problems of their own choosing.

Appointments will carry a stipend of $4,000 per year, plus $400 for each dependent. In addition, funds up to $2,500 per year are available to the chosen graduate school to cover tuition and costs. Additional information may be obtained from the Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee, which will administer the program for the Commission.

• **The National Science Foundation will award grants** to defray partial travel expenses for a limited number of U. S. scientists who wish to participate in the Second International Congress of Bioclimatology and Biometeorology. This Congress is scheduled to meet in London, England, September 5–10, 1960.

Application blanks may be obtained from the National Science Foundation, Washington 25, D. C. *Completed* application forms must be submitted by March 1, 1960.

• **The National Science Foundation will award grants** to defray partial travel expenses for a limited number of U. S. scientists who wish to participate in the Eighth International Grassland Congress. This Congress is to be held in Reading, England, July 11–21, 1960.

Application blanks may be obtained from the National Science Foundation, Washington 25, D. C. *Completed* application forms must be submitted by February 1, 1960.

• **At the 1959 meeting of the Plant Science Seminar** held at the University of Illinois College of Pharmacy, a new society to be known as *The American Society of Pharmacognosy* was formed. The Society was established by the unanimous consent of members present at the busi-

ness meeting of the Plant Science Seminar. Membership is open to all persons working in the field of pharmacognosy, graduate students, including workers of other nations.

• **The Division of Biology and Agriculture of the National Academy of Sciences—National Research Council** is establishing screening committees to allocate pooled funds to applicants for grants in support of travel to the following international congresses: Photobiology, Copenhagen, July 31–August 5, 1960; Histochemistry, Paris, August 28–September 3, 1960; Cell Biology, Paris, September 3–8, 1960; Embryology, Pallanza, Italy, September 15–20, 1960.

Requests for application forms for travel grants should be directed to the Division of Biology and Agriculture, NAS—NRC, 2101 Constitution Avenue, Washington 25, D. C. Awards will be an amount roughly equivalent to round-trip air fare to the congress. In order to be considered, completed application forms must be in the Division office **not later than January 1, 1960.** Awards will be announced by February 1, 1960.

• **The International Conference for Standards on a Common Language for Machine Searching and Translation** was held September 6–9, 1959 in Cleveland, Ohio. The specific aims of the conference were:

1. To encourage an environment for working toward a common machine language or a series of compatible machine languages for processing scientific and technical literature so that it may be searched, selected, correlated and translated by automatic equipment.

2. To characterize equipment requirements for use with common language systems or with compatible machine languages.

3. To create an environment in which it will be possible to foster agreements for cooperative processing and exchange of encoded materials for machine searching of the world's scientific literature.

4. To work toward initiating cooperative collection and analysis of scientific and technical terminology for preparation of dictionaries and thesauri for code establishment for use in machine searching and machine translation.

5. To promote cooperative research programs and free exchange of research materials.

6. To review interrelationships between machine literature searching and machine translation and to consider how progress in one field may advance the other:

• **The Ford Foundation has granted the University of North Carolina $326,599** to attract liberal arts majors into the teaching field. Liberal arts majors will be given special training in high school teaching with scholarships available.

• **Ten thousand secondary school teachers of science and mathematics will benefit from after-hours training during 1960-61** under a National Science Foundation program now in progress. The Foundation plans to support about 200 In-Service Institutes for Secondary School Teachers of Science and Mathematics that year, and announces that it will accept proposals from universities and colleges interested in sponsoring such institutes.

• **A Soil conservation stamp was issued August 26th at Rapid City, South Dakota.** Last year, the Post Office Department, in cooperation with the American Forestry Association, released a special 4¢ commemorative stamp for Forestry Conservation. This year, a special stamp was released for Soil Conservation. It was placed on sale August 26th in Rapid City, South Dakota in connection with the Soil Conservation Convention opening there that day.

• **The National Science Foundation** announced, after making a detailed survey, that there are 76 Soviet journals now available in English. The survey reports on the sources of Soviet scientific literature, availability of such literature in the United States, and the current translation programs of professional and academic groups and government agencies. Current methods of providing comprehensive coverage of untranslated Russian material were also analyzed. According to the survey, 2026 scientific journals and serials are being published in the USSR. Since 1956, Soviet scientific materials have become increasingly available in the United States. They are listed in the *Monthly Index of Russian Accessions*, published by the Library of Congress and available from the Superintendent of Documents, Government Printing Office, Washington, D. C.

• **The Thirteenth Annual Conference of the Southeastern Association of Game and Fish Commissioners** was held October 25–28, 1959 at the Emerson Hotel in Baltimore, Maryland.

• **A Symposium on the Ecology of Radioisotopes** was held October 19–23, 1959 at the University of Minnesota. The Symposium was concerned mainly with the pathway of radioisotopes from the time they enter soils until they are excreted from living systems. This symposium was cosponsored by the Atomic Energy Commission, The National Science Foundation and Agricultural Research Service of the United States Department of Agriculture.

• **The Report on the National Conference on the Legal Environment of Medical Science** is now ready for delivery. The Conference was held on May 27–28 at the University of Chicago. Copies of this report are available at $2.50 per issue. Contact the National Society for Medical Research, 920 S. Michigan Blvd., Chicago 5, Illinois.

• **The American Nuclear Society will hold its Winter Meeting this year in Washington, D. C., November 4–6.** Technical sessions, meeting headquarters and press room facilities for correspondents covering the meeting will be at the Sheraton Park Hotel.

• **The Department of Zoology of Colorado State University** has received a grant of $107,000 from the National Institutes of Health, effective October 1, 1959. The grant is designed to train future scientists in parasitology. It will be used to train doctoral candidates and provide additional post-doctoral research opportunities for those wishing to advance their work further.

• **Fifty-two scientists from foreign institutions** were among the one hundred and fifty guests at a dinner held in the Lorillard Snuff Mill at the New York Botanical Garden on the evening of August 12th, 1959. Dr. William C. Steere, Director, presided, and Dr. William Jacobs of Princeton University spoke on "Translocation of Auxins."

• **The Indiana Junior Academy has received a grant of $16,750.00** from the National Science Foundation for the establishment of a visiting scientist program in the Indiana high schools. Dr. Henry Michaud, State Sponsor of the Junior Academy, is chairman of the committee in charge of the program which is intended to encourage the improvement of the science programs in secondary schools.

• **The establishment of a new Department of Virology on the Berkeley campus of the University of California has been announced by the University.** It is one of the first departments in any major university in the world to be dedicated to the study of viruses and will be closely associated with the 10-year-old Virus Laboratory on the Berkeley campus.

• **In June, 1959, construction began on a new two-million-dollar addition to the Science Building of Wayne State University.** The construction of this wing, aided by a $500,000 grant from the U. S. Public Health Service, will provide teaching and research laboratories for the health directed activities of the Biology and Chemistry Departments. Research laboratories for physiology, endocrinology, radiobiology, parasitology, entomology and bacteriology will be in the new wing.

• **Certificates of Merit will be issued by the Committee on Education of**

the Society of American Bacteriologists to high school students (and to the sponsoring teacher) who do outstanding project work in bacteriology. Certificates will be given to those designated winners in regional, state, and national competitive programs at Science Fairs, Talent Search Contests, etc. Pertinent details should be forwarded to the Chairman of the Committee, Professor L. S. McClung, Department of Bacteriology, Indiana University, Bloomington, Indiana. The information supplied should include the name of student, school, sponsoring teacher, title of project, award and name of contest at which award was made. If the name of the individual is known, the material should be submitted through the Councilor of the Local Branch of the Society within the region of the home of the recipient.

• **The Mary Soper Pope Medal,** given by the Cranbrook Institute of Science for noteworthy and distinguished accomplishment in the plant sciences, was awarded, posthumously, to Dr. Kenneth W. Neatby at the IXth International Botanical Congress, held in Montreal, August 19–29.

• **The 1960 meeting of the Weed Society of America** will be held February 22–25, at the Cosmopolitan Hotel in Denver, Colorado. The Western Weed Control Conference will be host for the 1960 meeting.

• **The Biophysical Society** will hold its 4th annual meeting at the Sheraton Hotel in Philadelphia, Pennsylvania, from February 24–26, 1960.

• **A grant from the Fund for the Advancement of Education has** made it possible for the National Education Association to send a research report to each official whose name appears in the *Higher Education Directory*. This biennial study of staff needs, along with the biennial study of the salary structure of higher education, is conducted by Ray C. Maul, assistant director of the NEA Research Division.

• **In an illustrated manual, *Algae in Water Supplies,*** recently released by the U.S. Public Health Service, scientists have discovered that the fresh water algae may eventually supplement food and forage products and become a new source of vitamins, animal feed, fertilizer, and other organic products useful to man. This report is the result of an eight-year study by C. M. Palmer and Harold J. Walter at the Public Health Service's Sanitary Engineeringing Center in Cincinnati.

•**Six American scientists** are surveying the progress of metabolic disease research in the Soviet Union, the Department of Health, Education and Welfare has announced. The study team left for the Soviet Union on August 31, and remained approximately 20 days. The mission was sponsored by the Public Health Service's National Institute of Arthritis and Metabolic Diseases.

• **The University of Texas Board of Regents,** following action by the Texas Legislature, has authorized construction and has appropriated $250,000 for a research building at the Institute of Marine Science, Port Aransas, Texas.

• **The National Cancer Institute** of the U.S. Public Health Service has awarded an $11,171 grant to Dr. I. Alden Macchi of Newton Upper Falls, Massachusetts to continue research on "Steroidogenesis in Regenerated Adrenocortical Tissue."

• **The Second International Conference of Human Genetics will be held on September 6–12, 1961.** All meetings will be held in the Conference Building of the Food and Agriculture Organization of the United Nations. The organization of the Conference will closely follow the successful pattern established at the First International Congress of Human Genetics held in Copenhagen in 1956.

• **Brigadier General B. G. Holzman has announced** that eight contracts for basic research in scientific areas of interest to the Air Force have been awarded to six South American universities and institutions. The sciences concerned are atmospheric and space physics, mechanics, aerodynamic and human factors.

• **The Lalor Foundation has announced its program of awards for 1960.** These are offered for research in the biological sciences and will be for the support of research on the fundamental biochemical and physiological mechanisms concerned with fertility and reproduction in various forms of life. The awards may range up to $8,000 per year depending upon the scope and duration of the projects approved.

The Foundation will also grant postdoctorate summer or short-term research awards at the Marine Biological Laboratory at Woods Hole, Massachusetts, or elsewhere for appropriate projects in the fields specified.

For further information please contact the Lalor Foundation, 4400 Lancaster Pike, Wilmington 5, Delaware. January 15, 1960 is the final date to receive executed application forms.

• **Eighty-seven zoologists interested in the teaching of and research on the invertebrates** attended an informal social gathering and coffee hour held at the AIBS meetings at The Pennsylvania State University in September. After the social hour an ad hoc steering committee was formed to arrange another meeting of invertebrate zoologists for the 1960 AIBS meetings at Stillwater, Oklahoma. In addition to other events, the committee plans to hold a symposium on "Problems in Teaching Invertebrate Zoology" to be arranged by Clarence J. Goodnight and Charles F. Lytle.

The Invertebrate Zoologists' Steering Committee membership includes: Bertil G. Anderson, Sears Crowell, Ralph W. Dexter, C. J. Goodnight, Willis H. Johnson, David R. Lincicome, and C. F. Lytle, secretary. Persons interested in future activities of the group and not on the present mailing list should correspond with the secretary at the Department of Zoology, Indiana University, Bloomington, Indiana.

• **Dr. Clarence J. Hylander, first Executive Secretary of the AIBS,** and currently Visiting Professor of Biology at Bowdoin College, has recently completed a series of books designed primarily for the young naturalist. Included in the series are: *Trees and Trails, Insects on Parade, Animals in Armor, Sea and Shore, Animals in Fur,* and the most recent one, *Feathers and Flight.*

Dr. Hylander has been developing this series for over ten years and the result is a combination of scientific fact and youthful interest. Fascinating avenues are opened to the reader in the important biological fields of ornithology, botany, entomology, oceanography, forestry, zoology, herpetology, and wildlife management. All of the volumes are published by the Macmillian Company and are moderately priced.

• **The Phycological Society of America,** during the recent International Congress of Botany meetings held in Montreal, elected the following officers for 1960; President, Richard C. Starr, Indiana University; Vice-President, Jack Myers, University of Texas; and Secretary-Treasurer, William A. Daily, Eli Lilly Company. The Society voted to meet with AIBS in 1960 at Oklahoma State University.

• **The Fourth Annual Philips Lecture Series in Biology** will begin November 5, 1959, at Haverford College, Haverford, Pennsylvania. The topic of the series this year is "Biological Specificity", and the speakers will be: Cyrus Levinthal, Massachusetts Institute of Technology, November 5; Hans Neurath, University of Washington, December 3; Melvin Cohn, Stanford University, December 10; Irwin Sizer, Massachusetts Institute of Technology, January 7; Elvin A. Kabat, Columbia University, February 11; Albert Tyler, California Institute of Technology, March 10; James Ebert, Carnegie Institution of Washington, March 24; R. A. Billingham, Wistar Institute of Anatomy and Biology, April 7; and Tracy M. Sonneborn, Indiana University, April 20.

• **An international Darwin Centennial Celebration will be held in November** by the University of Chicago, with the cooperation of the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, and the Na-

tional Institutes of Health. Commemorating the impact of Darwinian evolutionary theory on scientific thought, the Celebration will open November 24, the centenary of the publication of the *Origin of Species*, and continue through November 28. Meetings will be held on the University campus, and will bring together leading figures in the social and biological sciences to discuss the evolution of life, of man, and of the mind.

• **Dr. Karl Sax** is to be Visiting Professor of Botany at the Gibbs Research Laboratory, Yale University, New Haven, Connecticut, from September 1, 1959 to September 1, 1960.

• **Dr. J. Y. Peary,** Professor of biology and chairman of the Division of Natural Sciences at Benedict College, South Carolina, spent three months at Hazelton Laboratories as a summer guest scientist. He has been doing research in cellular physiology.

• **David D. Keck** has resigned his position at the New York Botanical Garden in order to remain premanently as Program Director of Systematic Biology of the National Science Foundation's Division of Biological and Medical Sciences. He came to this position in October 1958 on leave of absence from the Garden.

• **Maxine Langford Abbott,** research associate in paleobotany at the University of Cincinnati, has received a $20,900 National Science Foundation grant which will enable her to step up her researches on 250-million-year-old fossil tree ferns.

• **Alvin Nason,** Professor of Biology at the Johns Hopkins University, has been appointed Associate Director of the McCollum-Pratt Institute effective July 1, 1959. Dr. Nason has been at Johns Hopkins since 1949 and holds membership in the American Society of Biological Chemists, the American Chemical Society, the American Society of Plant Physiologists, the Society of American Bacteriologists, and the American Association of University Professors.

• **Elizabeth G. Frame,** a senior scientist in the Commissioned Corps of the Public Health Service, has been appointed to a staff position in the Center for Aging Research of the National Institutes of Health. The Center is part of the Division of General Medical Sciences.

• **Archie Carr** has been promoted to Graduate Research Professor at the University of Florida, Gainesville.

• **Irving G. Kagan,** chief of the Helminthology Laboratory of the U.S. Public Health Service's Communicable Disease Center, Atlanta, Georgia, was assigned for one month (June 15—July 15, 1959) as technical advisor to the World Health Organization, Switzerland, to assist in an evaluation of immunological methods in the diagnosis and epidemiology of schistosomiasis.

• **John C. Marr** has been appointed Director of Honolulu Biological Laboratory. Marr was formerly Director of the La Jolla Biological Laboratory.

• **Xavier J. Musacchia,** associate professor of biology, St. Louis University, spent the summer at the Marine Biological Laboratories and will continue his research investigations in the physiology of digestion in fish. This research is supported by a grant from Sigma Xi, national scientific honorary society.

• **John M. Ward,** associate professor of biology at Temple University, has been appointed Chairman of the Department of Biology in the College of Liberal Arts at Temple University.

• **Eugene Copeland,** former staff member of the National Institutes of Health, has been named professor and chairman of the department of zoology in the College of Arts and Sciences at Tulane University.

• **Richard E. Benson,** and **John A. Narcross,** both of the U.S. Air Force, have been assigned to the Atomic Energy Commission's Division of Biology and Medicine at Commission Headquarters, Germantown, Maryland, the former as a veterinarian and the latter as an industrial physician.

• **Joseph R. Bailey,** Duke University and **James W. Hardin,** North Carolina State College, have been elected to the Board of Trustees of the Highlands Biological Station.

• **Albert Schatz,** Scientific Director of Scientific Associates, has recently received the Man of the Year Award from the Drug and Allied Products Guild. This is an annual award given "for outstanding service to mankind." Dr. Schatz, who is the co-discoverer of streptomycin, has developed the proteolysis-chelation theory of dental caries which has attracted worldwide attention as a new approach to the problem of tooth decay.

• **George H. Bick,** Associate Professor of Biology at Southwestern Louisiana Institute, has resigned to accept a position as Professor of Biology at Clarion State College, Clarion, Pennsylvania. During the summer Dr. Bick taught at the University of Oklahoma Biological Station.

• **Emil Witschi,** new president of the American Society of Zoologists, Department of Zoology, State University of Iowa, has been in France the past three months as visiting professor at the University of Paris. During his stay he delivered a series of six lectures on the biology of reproduction

• **Jerome Aronson** currently completing a post-doctoral fellowship at Leeds, England, has been appointed Assistant Professor of Biology at Wayne State University. He will develop a research and teaching program in plant physiology.

• **William L. Thompson,** University of California, Berkeley, will assume his duties as Assistant Professor of Biology at Wayne State University to develop a teaching and research program in vertebrate physiology for the fall, 1959 semester.

• **Donald T. Forman** will head the biochemistry section in the pharmacology-biochemistry department, Hazelton Laboratories, Falls Church, Virginia and Palo Alto, California. Also, Jiro Kodama will supervise toxicological investigations in the same department.

• **Vincent Schultz,** Associate Professor of Biostatistics, University of Maryland, has been granted a one year leave of absence to work with Environmental Sciences Branch, Division of Biology and Medicine, U. S. Atomic Energy Commission.

• **Franklin W. Stahl** is now on the staff of the Institute of Molecular Biology as associate professor of biology. He comes from the University of Missouri, where he has been an associate professor of zoology for the past year.

• **Charles L. Ravaris** has been appointed an assistant medical director of E. R. Squibb and Sons.

• **Stanley I. Auerbach,** Ecologist with the Oak Ridge National Laboratory, has been promoted to Chief of the newly created Ecology Section in the Health Physics Division of the Oak Ridge National Laboratory.

• **William C. Steere,** Director of the New York Botanical Garden, received the honorary degree of Docteur-ès-Sciences from the University of Montreal during a special convocation held in conjunction with the Ninth International Botanical Congress in Montreal. Frere Lucien Levesque, who presented Dr. Steere for the degree, spoke of his international reputation for scholarly investigation.

• **Neville L. Bennington,** a member of the American Society of Zoology, has been appointed Acting Head, Institutes Section, Scientific Personnel and Education, National Science Foundation. Dr. Bennington is currently on leave of absence

from his position as a Professor of Biology and Pre-medical Program Director at Beloit College, Wisconsin. The purpose of the Institutes is to make it possible for teachers in elementary and secondary schools and colleges to obtain additional instruction and to become acquainted with new developments in science and mathematics.

Recent Deaths Among Biologists:

William Baumgartner, an educator and University of Kansas Zoologist, April 12, 1959.

Robert B. Wylie, Professor Emeritus of Botany, State University of Iowa, June 8, 1959 at Iowa City.

Lydia Bourne Walsh, Chairman of the Division of Natural Sciences, Elmira College, June 8, 1959.

Hinson Hill, Chief of the Horticultural Department, Central Experimental Farms, Ottawa, Canada, July 21, 1959.

Reiner Bonde, University of Maine, Orono, Maine, July 13, 1959. He was a nationally known authority on potato diseases and their control.

Edward H. Hatton, for many years the Secretary-Treasurer of the International Association for Dental Research, August 14, 1959.

R. E. Phillips, Head, Department of Poultry Husbandry, Iowa State University of Science and Technology, Ames, Iowa. August 14, 1959.

Otis M. King, Weatherford, Ohio, a member of the American Society of Mammalogists.

E. Newton Harvey, Henry Fairfield Osborn Professor at Princeton University, in Woods Hole, Massachusetts.

From the Societies

• **The International Association for Dental Research** will hold its thirty-eighth General Meeting at the Morrison Hotel, Chicago, Illinois, from March 17–20, 1960. New officers of the Association are: President, Hamilton B. G. Robinson; President-Elect, Holmes T. Knighton; and Vice-President, James A. English.

• **The Poultry Science Association announces election** of the following officers: President, Gordon E. Bearse, Western Washington Experiment Station, Payallup, Washington; 1st Vice-President, T. C. Byerly, U.S.D.A., Washington, D. C.; 2nd Vice-President, C. S. Shaffner, University of Maryland, College Park; Secretary-Treasurer, C. B. Ryan, Texas A.&M. College, College Station; Directors, H. R. Bird, A. W. Brant, J. H. Bruckner, J. W. Sicer, and J. C. Driggers. Editor, H. D. Branion, Department of Nutrition, O.A.C., Guelp, Ontario, Canada.

• **The Biological Photographic Association, Inc., announces election** of the following officers: President, Verlin Y. Yamamoto; Vice-President, Mervin W. La Rue. The Association has also announced the following awards: The Louis Schmidt Award to Paul Holinger and the Fellowship Award to Joseph E. Mineo.

• **The Entomological Society of America has received a grant** of $1,340.00 from the Rockefeller Foundation to pay the travel expenses of Dr. Jaroslav Weiser to the November 30–December 3, 1959 meeting of the Society in Detroit. Dr. Weiser is head of the Insect Pathology Laboratory, Biological Control Institute in Praha, Czechoslovakia and an internationally recognized insect pathologist. He will participate in a symposium on Biological Control at the Detroit meeting.

P. W. Oman, President of the Society has announced the appointment of Dr. W. H. Anderson as Society Representative to the National Research Council, Division of Biology and Agriculture. He replaces Dr. A. B. Gurney and will serve until June 30, 1962.

• **The Association of Official Seed Analysts** held its 51st annual meeting at Montana State College, Bozeman, Montana, June 15 to 19, 1959. Officers elected were: President, L. C. Shenberger, Purdue University, West Lafayette, Indiana; Vice-President, C. M. Bass, Assistant Director, Bureau of Plant Industry, Virginia Department of Agriculture, Richmond; Secretary-Treasurer, Dwight D. Forsyth, Wisconsin State Department of Agriculture, Madison.

The 52nd annual meeting is scheduled for Springfield, Illinois, from June 20 to 24, 1960.

• **The Botanical Society of America** met in Montreal, Canada, August 23, during the activities of the IXth International Botanical Congress. New officers elected were: President (1960), K. V. Thimann, Harvard University; Vice-President (1960), P. J. Kramer, Duke University; Secretary (1960–65), B. L. Turner, University of Texas.

James Bonner, of the California Institute of Technology, was reelected as a member of the Editorial Committee of the *American Journal of Botany* for the years 1960–63.

Dr. Jack Myers of the University of Texas was awarded the Darbaker prize of $250.00 for his significant contributions in the field of phycology.

Dr. Harriet B. Creighton has resigned as editor of the Plant Science Bulletin, and will be succeeded by Dr. Sydney S. Greenfield of Rutgers University.

Dr. Lawrence J. Crockett of Barnard College, Columbia University has been selected for the new position of advertising manager of the *American Journal of Botany*.

Dr. F. G. Gregory of the University of London, England and Dr. Hamshaw Thomas of Downing College, Cambridge, England were elected to CORRESPONDING MEMBERS of the Botanical Society of America.

• **The Potato Association of America** has presented a life membership in the Association to George Cocherham, Scotland; N. M. Parks, Ottawa, Canada; and D. J. MacLeod, Fredericton, Canada.

• **The American Physiological Society** had its Fourth Henry Pickering Bowditch Lecture, at Urbana, Illinois, September 9 given by Dr. Lloyd M. Beidler, Professor of Physiology, Florida State University, Tallahassee, Florida, on "The Physiology of Taste."

The American Physiological Society William T. Porter Fellowship has been awarded to Donald F. Laws, Zoology Department, State College of Washington, Pullman, Washington.

• **The Society of American Bacteriologists** has recently established its National Headquarters at 19875 Mack Avenue in Detroit, Michigan. Raymond W. Sarber, formerly of the Research Division, Parke Davis & Co., has been appointed Executive Secretary of the Society and will be in charge of the operation of the headquarters.

• **The Society for the Study of Development and Growth** at its annual business meeting held in June 1959, elected the following officers for the year October 1959 to September 1960: President, Edgar Zwilling; Secretary, William P. Jacobs; Treasurer, H. Clark Dalton; other members of the Executive Committe: Folke Skoog, Dietrick Bodenstein, and Arthur W. Galston.

• **The National Pest Control Association** held its 26th annual convention in Biloxi, Mississippi on October 19–22, 1959 at the Hotel Buena Vista.

• **The American Fisheries Society** announces the appointment of Mr. E. A. Seaman, Secretary of the Society, as a member of the National Coordinating Committee-Mosquito Control and Wildlife Conservation. The organizational meeting of the Committee was held on Wednesday, September 16, 1959, in the Department of Interior Building, Washington, D. C.

• **The Society for the Study of Evolution** will hold its annual meeting in Chicago, Illinois, November 23–28, 1959, in conjunction with the Darwin Centennial Celebration of the University of Chicago. Headquarters will be the Hotel Shoreland, 5454 South Shore Drive, Chicago 15, Illinois.

• **The Society of General Physiologists** announces the election of new officers, effective September 10, 1959: President,

Wm. D. McElroy, The Johns Hopkins University, Baltimore, Maryland; Vice-President, John B. Buck, National Institutes of Health, Bethesda 14, Maryland; Secretary, J. W. Green, Rutgers University, New Brunswick; Treasurer, E. G. Boettiger, University of Connecticut, Storrs; Councilors: W. A. Arnold, Oakridge National Laboratory, Oak Ridge, Tennessee, and H. G. Rundfest, Columbia University, New York.

• **The American Society of Ichthyologists and Herpetologists** has announced election of the following officers for 1960: President, Norman E. Hartweg, University Museums, Ann Arbor, Michigan; President-Elect, George A. Moore, Department of Zoology, Oklahoma State University, Stillwater; Vice-President (Conservation), Charles E. Shaw, San Diego Zoo, California; Vice-President (Finance), Giles W. Mead, U.S. Fish and Wildlife Service, National Museum, Washington, D. C.; Vice-President (Membership), Royal D. Suttkus, Dept. of Zoology, Tulane University, New Orleans; Treasurer, James E. Bohlke, Academy of Natural Sciences, Philadelphia; Secretary, Roger Conant, Philadelphia Zoological Garden.

The annual meeting will be held in June 1960 at the Chicago Natural History Museum. The exact dates have not yet been decided.

• **The Mycological Society of America** has elected the following officers for 1960: President-Elect, J. L. Lowe, Syracuse University, Syracuse, New York; President, C. W. Emmons, National Institutes of Health, Bethesda, Maryland; Vice-President, E. S. Beneke, Michigan State University, East Lansing; Secretary-Treasurer, R. K. Benjamin, Rancho Santa Ana Botanic Garden, Claremont, California; Councilor (East), E. G. Simmons, Quartermaster R. and D. Center, Natick, Massachusetts; Councilor (West), R. M. Page, Stanford University, Stanford, California.

• **Officers for the Genetics Society of America** for 1960 are: President, J. F. Crow; Vice-President, H. B. Glass; Treasurer, Drew Schwartz; Secretary, W. L. Russell.

The Genetics Society of America is a cosponsor of the AAAS Meeting, December 28–31, 1959, on "Germ Plasm Resources in Agriculture."

• **The Society of Protozoologists has announced** new officers elected at the annual AIBS meetings at the Pennsylvania State University. New officers are: President, Norman D. Levine, College of Veterinary Medicine, University of Illinois, Urbana; and Vice-President, Reginald D. Manwell, Syracuse University, Syracuse, New York. New members of the Executive Committee are: Elmer R. Noble, Santa Barbara College, University of California, Goleta; and Charles Ray, Jr., Emory University, Emory, Georgia. The Agricultural Research Institute Representative and Alternate are: Bronislaw M. Honigberg, University of Massachusetts, Amherst; and Charles M. Vaughn, University of South Dakota, Vermillion. The AAAS Representative for 1960 is Eugene M. Kozloff, Lewis and Clark College, Portland, Oregon. New members of the Editorial Board are: Dorothy Ballantine, Geoffrey Beale, H. E. Finley, B. M. Honigberg, R. E. Hungate, Miklós Müller, Dorothy Pitelka and E. G. Pringsheim.

• **The American Society for Horticultural Science** has announced new officers for 1959-60, elected at the meetings at the Pennsylvania State University: Chairman, Executive Committee, Freeman S. Howlett, Ohio State University; President, H. A. Rollins, University of Connecticut; Vice-President, V. T. Stoutemyer,, University of California at Los Angeles; Secretary-Treasurer, Roy E. Marshall, Michigan State University; Editor John R. Magness, U.S.D.A., Plant Industry Station.

The following awards for the best research papers published during the past year were announced at the annual banquet: The Leonard H. Vaughan Award in Vegetable Crops to Margaret N. Lesley and J. W. Lesley, University of California Citrus Experiment Station, for a paper entitled "Male Sterile Mutants in Tomato from Seed Treated with Radioactive p^{32}," published in Volume 71 of the Proceedings. The Leonard H. Vaughan Award in Floriculture to Sam Asen and N. W. Stuart, U.S. Department of Agriculture for a paper entitled "Effect of Low Temperature on the Free Amino Acids of Dormant *Hydrangea macrophylla* as Revealed by Paper Chromatography", published in Volume 71 of the Proceedings. The Alex Laurie Award in Floriculture and Ornamental Horticulture for work completed during graduate study to Clark D. Paris and W. J. Haney, Michigan State University, for a paper entitled "Genetic Studies in Petunia. I. Nine Genes for Flower Color", published in Volume 72. The Charles G. Woodbury Award in Raw Products Research to J. N. Moore, A. A. Kattan, and J. W. Fleming, University of Arkansas, for a paper entitled "Effect of Supplemental Irrigation on Yield and Processing of Tomatoes", published in Volume 71. The Joseph Harley Gourley Award in Pomology to C. B. Shear, U.S. Department of Agriculture, for a paper entitled "Responses of Tung Trees in Sand and Soil Cultures to Ratios of Ammonium to Nitrate Nitrogen and Levels of Potassium and Zinc", published in Volume 72.

• **New officers of the American Phytopathological Society** are: President, William C. Snyder; President-Elect, S.E.A. McCallan; Vice-President, William B. Hewitt; Secretary, George A. Zentmyer. The 1960 annual meeting will be held in Green Lake, Wisconsin, August 27 to September 1, 1960.

• **The annual meeting of the American Academy of Microbiology** will be held on Monday, May 2, 1960 at the Bellevue-Stratford Hotel in Philadelphia. Also announced by the Academy is a one-day conference on the "General Philosophy of Education in Microbiology." The conference is being planned for Saturday, April 30, 1960 and will also be held in Philadelphia.

• **The American Association of Bioanalysts** has recently been accepted as an Affiliate Society of AIBS. The membership of this Association is composed of persons who work toward the direction and application of the life sciences to clinical laboratory analyses, those who teach these disciplines in universities, and those who hold commissions and assignments in the allied sciences category of the armed forces. In addition to an annual meeting held in various localities, the association also sponsors many smaller gatherings to satisfy local interest. The Association sponsors three publications: a quarterly, *The Abstracts of Bioanalytic Technology*; a journal, *Bioanalysis;* and a news letter, *The Bulletin*.

• **The American Society of Mammalogists** has announced that its 1960 annual meeting will be held at the College of Puget Sound, Tacoma, Washington. Definite dates have not yet been set. There is no change in officers of the Society for 1959–60.

The Society has also announced the establishment of two competitive honoraria of $100 each, to be awarded to pre-doctoral mammalogists to enable them to present their papers at the annual meeting.

Letters to the Editor

July 14, 1959

Cheers for you for running the Wylie article in the AIBS Bulletin, June 1959. It would be a good thing if all scientific journals exposed their readers regularly to a peppery layman, informed or not.

Marc Rosenblum
Executive Editor
PUBLIC HEALTH REPORTS
Department of Health, Education and Welfare
Washington 25, D. C.

I agreed with much of what Mr. Wylie had to say in his article "A Layman Looks at Biology" in the June issue of the AIBS Bulletin. Still I cannot refrain from commenting on his criticism of the large and unfamiliar words used by biologists. I can sympathize with his viewpoint inasmuch

as an important part of my job is to interpret the jargon of research men into terms that are understandable to laymen. Still, we must recognize that every profession has a unique and useful vocabulary. The fact that Mr. Wylie's profession is no exception is evident from a perusal of his essay. The following fifteen words serve to illustrate my point:

ancillary	feuilleton
anent	idioglossary
asperse	immolate
burgraves	parochial (responses)
derogate	ploy
disquisition	sesquipedalianism
dubieties	soidisant
feckless	

I seriously question whether the average layman to which Mr. Wylie refers could correctly define more than half a dozen of these words. If these words had no suitable simple and familiar synonyms, their use would be excusable, but such was not the case. One suspects that Mr. Wylie is guilty of the same "unconscious vanity" for which he condemns biologists.

At any rate, I am certain his criticisms would have been much more effective if it were not for his sesquipedalian idioglossary.

Thomas M. Little
Extension Vegetable Crops Specialist
Agricultural Extension Service
University of California
Riverside, California

July 15, 1959

Last evening I found in my mail the most recent AIBS Bulletin in which I found to my amazement (though, on reflection, I shouldn't have been amazed) four pages of the opinions of Mr. Wylie who has been one of my favorite people ever since my Generation of Viper days.

Let me extend my hearty congratulations. Would that we had more laymen like Wylie to buffer all our inflationary tendencies. In all fairness, though, I am a bit confused. Does Mr. Wylie feel I may have misspent my time in the past reading Wylie (along with a wide assortment of other extra-curricular matter), since I have been heard to complain that "keeping abreast" is next to impossible? I confess to curiosity about the tone of your mail reactionary to the essay.

Philip G. Seitner
Washington, D. C.

July 23, 1959

It is of course a good thing that the layman is interested in biology. And I agree wholeheartedly with what I think is Mr. Philip Wylie's major thesis: that biologists should make themselves and their science better known to the "people".

I suspect that Mr. Wylie deliberately wrote his essay so as to provoke us, and is not really quite so vehement about our shortcomings. Still, I do want to argue several of his points.

He takes us to task for our development of languages becoming more and more incomprehensible to the layman and to other scientists. I must note however, that his own sesquipedalianism (I had to look it up, but it is now part of my vocabulary) had me reeling and forced me to keep a ready hand on the dictionary. Certainly, many words in scientific literature are unnecessarily complex, but one could hardly substitute "mixed-up chromosomes" for "reciprocal translocation" or "This is a flower", for "This is *Nicotiana clevelandii*". There are times when precision is necessary and precision can often be attained only with new words for objects or concepts which are different from all other objects or concepts.

Mr. Wylie refers often to the "layman, reasonably intelligent and fairly well-informed." This person is obviously Mr. Wylie himself. He wishes that the biologist possessed his own intellectual worldliness and breadth of knowledge. I am acquainted with many reasonably intelligent and fairly well-informed laymen. Few of them are as knowledgeable as Mr. Wylie quite plainly is. I would say he is extraordinarily well-informed. This leads to the following thesis: In any field there are a few, and only a few, who possess the Wylian virtues—knowledge and interest in many disciplines and arts. The pedestrian biologist knows little outside his own field; this is true of the average author, physicist, psychologist, and candlestick maker. From my own acquaintance with people, I'd say the proportion of biologists who keep up with the world is actually somewhat higher than that of some of the other groups.

Again I agree with his main thesis. Biologists as a group should tell the public about their work and should contribute more of themselves to the world around them.

Maybe Mr. Wylie could help out by making the Poseidon available to biologists at reduced rates.

Edward J. Ryder
Geneticist
U.S. Agricultural Research Station
Salinas, California

A.I.B.S. Reports

• **The AIBS has been awarded a grant of $9,085** by the National Science Foundation for the support of a "Study of the Feasability of Establishing a Joint Editorial-Business Managerial Office for Certain Biological Periodicals," under the direction of Francis C. Harwood, Director of Publications. The grant became effective on August 18, 1959 and will be one year in duration.

• **The Biology Conference of the Advanced Placement Program** of the College Entrance Examination Board met from June 25 to 28, 1959 at Chatham College in Pittsburgh. Dr. Oswald Tippo, Chairman of the AIBS Education Committee, spoke on the subject of the AIBS Education Program with special emphasis on the Secondary School Film Series. During the discussion period which followed secondary school biology teachers were given an opportunity to comment on the Film Series.

• **Joseph Grossman, an AIBS Staff Member,** recently returned from a three-month trip to Russia. Mr. Grossman was a guide to the American National Exhibition in Moscow.

• **Robert S. Leisner, Director of Education,** and **Francis C. Harwood, Director of Publications for AIBS,** represented AIBS at the Silver Jubilee Dinner of the National Association of Science Writers on September 16, 1959. The dinner was held in conjunction with the annual meeting of the American Chemical Society in Atlantic City, New Jersey.

• **Fred R. Cagle, Executive Secretary of the Conference of Biological Editors,** reports that the Conference held its second annual meeting at the Chicago Natural History Museum, Chicago, Illinois, April 11-12, 1959. The fifty-three participants included forty-eight editors representing more than ninety-two biological serials, three representatives of commercial publishers and two representatives of the National Science Foundation. Under the chairmanship of Dr. Bentley Glass the conferees discussed the following major topics: economics of journal publications; planning for cooperative publication; publication of the journal *Wildlife Disease* in microform; publication of a style manual for biological journals; editorial policy; machine retrieval of information; the activities of the Science Information Service of the National Science Foundation; activities of the National Federation of Science Abstracting and Indexing Services; activities of the AIBS Committee on Science Information.

• **Two new commercial concerns have joined the AIBS** as Associates: Eugene Garfield Associates and Professional Tape Company, Inc.

Eugene Garfield Associates is located in Philadelphia, Pennsylvania and is a consultant firm. In the science field the firm specializes in publications which cover the broad interests of medical, chemical and pharmacological research scientists in addition to reproductions of contents pages of nearly 450 primary scientific journals.

Professional Tape Company, Inc. is located in Riverside, Illinois and specializes in the production and distribution of laboratory tapes and labels. Their scientifically developed adhesive *Time Standard* and *Hi-Temp Tapes Labels* are completely unaffected by heat, steam, cold temperatures, acids, alkalies, moisture, and oxidation. These tapes will adhere to any surface. The company also produces labels which will

withstand complete sterilization cycles in an autoclave.

• **The AIBS has been awarded a grant of $31,280 by the National Science Foundation** for support of a program of "Visiting Scientists in Biology" under the direction of Hiden T. Cox, Executive Director. The program is directed at small universities and liberal arts colleges and continues to be well received. The grant was effective July 1, 1959 and will continue for approximately one year. In addition, the National Science Foundation has informed the AIBS that support of the program will be continued until June, 1961.

The Atomic Energy Commission has awarded the AIBS a contract in the amount of $6,000 for continued support of the Visiting Lecturers Program in radiobiology. This program is also directed at small universities and liberal arts colleges but includes secondary schools as well. The contract became effective June 30, 1959 and will continue until June 30, 1960.

• **An AIBS ad hoc Advisory Committee to AEC** met on September 28th in Washington, D. C. The group reviewed the Commission's research efforts in isolating and characterizing erythropoietin.

• **Under the auspices of AIBS** and the sponsorship of Fort Detrick a symposium on "Nonspecific Resistance to Infection" was held at Hood College, Frederick, Maryland, September 16–17, 1959. Dr. Colin M. MacLeod, Professor of Research Medicine, University of Pennsylvania, served as chairman.

• **Dr. John R. Olive** has replaced **Mr. Irvin C. Mohler** as Assistant Executive Director of the AIBS. Dr. Olive is on leave of absence from Colorado State University, Fort Collins, where he is Professor of Zoology and Assistant Director of the Colorado State University Research Foundation. Mr. Mohler, who was with the AIBS for 5 years, has accepted a newly created position as Executive Officer of the John Hopkins University Department of Biology. When he resigned, Mr. Mohler had been in continuous service of the Institute longer than any other staff member. The best wishes of the AIBS go with him to his new position of great responsibility.

• **Under the auspices of AIBS** and the sponsorship of the Office of Naval Research, the First International Symposium on Natural Mammalian Hibernation was held at Endicott House, Dedham, Massachusetts, May 13–15, 1959. Dr. Charles Lyman, Harvard Medical School, served as chairman.

• **The AIBS Advisory Committee on Education and Training to AEC** met September 9, 10, 11, 1959 in San Francisco, California. The committee reviewed the AEC project at the University of California, Berkeley, as well as forty-five proposals for equipment grants. Dr. J. Newell Stannard is Chairman of this Committee.

• **The second meeting of the AIBS ad hoc Committee on the Chemistry of Organo-Boron Compounds to AEC** met in New York City on September 25, 1959, in the Board Room of the American Institute of Physics. The committee's specific charge was a continuation of the review of AEC's research efforts in the area of boron chemistry as it relates to brain tumor studies.

• **AIBS PLACEMENT SERVICE**

At the recent Penn State meeting the AIBS Placement Service registered 149 candidates during the convention period, with approximately 68% scheduled for interviews. Over fifty employers were in attendance to interview prospective employees. Prior to the convention and during the four days of sessions over 116 positions (teaching and research) were registered.

Dr. W. E. Cooper, representing the American Phytopathological Society, was present each day in the Placement Service office. He devoted his time to discussing the possibilities of employment in the field of phytopathology and to vacancies with which he was familiar. The AIBS would like to express appreciation of the fine contribution he made to the success of the Placement Service activities.

The Placement Service Directories are published in January and June of each year. Based upon past experience, the Service recommends that all June graduates in biology (1960), who may be seeking placement, register for the January issue of the Directory. **Deadline for registration is December 11, 1959.** Application forms may be obtained from the AIBS Placement Service, 2000 P Street, N. W., Washington 6, D. C. A supply of June Placement Directories are still available and employees interested in obtaining this list of registrants may do so for $1.00.

Biology Library

One copy of each publication submitted for listing should be sent to the Editor, AIBS Bulletin, American Institute of Biological Sciences, 2000 P Street, N.W., Washington 6, D. C. Only books published within a year of receipt will be reviewed. Books marked with an ★ are those published by Bulletin advertisers.

ANATOMY

Comparative Anatomy. WILLIAM MONTAGNA. 397 pp., illus. John Wiley and Sons, Inc., New York, (1959) $6.00.

In these days of experimentalism, when every science is a moving frontier, it is not surprising to find a treatment of comparative vertebrate anatomy that is grounded in the comparative ontogenetic development of living vertebrates rather than in vertebrate phylogeny based on fossil forms. Professor Montagna's textbook obtains remarkable coherence and development by his strict adherence to this method of presentation. The intricacies of vertebrate ascent are ignored, yet the obivous recapitulations present in the ontogenies of many organ systems give an impressive demonstration of the hierarchical organization of the vertebrate classes.

The major virtues of this text are its brilliant condensations and careful delineations of developmental sequences of organ systems. These condensations of development are usually generalized in such a way that comparison of the adult anatomies of the several classes becomes an integrated discipline for the student. This pedagogic device succeeds because of the remarkable diagrams which illustrate the text; these diagrams are indeed distillations of anatomy and are beautifully conceived. The book combines diagrammatic embryology with comparative anatomy in a way that is thoroughly rewarding. Some subjects that appear particularly notcworthy in their presentation are the skin and its derivatives, the development of vertebrae, the venous system, the urogenital system, and the nervous system.

At first browsing, this book might appear elementary since it lacks detailed presentations of taxonomy, references to specific genera or species, important vertebrate fossils, and even a family tree of vertebrates. However, it is to the author's credit that he has developed an integrated and sensible coverage without these considerations. The book is not so much a comparative treatment of the anatomy of the vertebrate classes as it is a fundamental grounding in the anatomy of all vertebrates. As such, it would seem to make an admirable text for a second year course to be followed perhaps by material on vertebrate phylogeny from the paleontological point of view and general embryology stressing principles of development. In view of the fact that paleontologists have been divorced from the immediate circle of most zoologists, Montagna's approach to the comparative anatomy of vertebrates should be given serious consideration. *Frank M. Child, Dept. of Zoology, Univ. of Chicago, Chicago 37, Illinois.*

BIOCHEMISTRY

Methods of Biochemical Analysis, Volume 7. Edited by DAVID GLICK. 353 pp., illus. Interscience Publishers, Inc., New York and London (1959) $9.50.

The present volume maintains the high standards set by the preceding volumes. Especially valuable in this series is the balance that is struck between chapters dealing with more or less specific procedures for specific substances on the one hand, and more general discussions of certain broad procedures and techniques on the other. Thus, in this volume are found chapters dealing specifically with the determination of heparin, creatinine, ethyl alco-

hol, inositol, ethanolamine, serine, and alkaloids of toxicologic importance. There are also chapters with more general discussions dealing with lipoprotein lipase, immunoelectrophoretic analysis, and spectopnotometry of translucent systems by the opal glass method. *Parkhurst A. Shore, National Heart Institute, Bethesda, Maryland.*

A Symposium on the Chemical Basis of Development. Edited by WILLIAM D. McELROY and BENTLEY GLASS. The Johns Hopkins Press, Baltimore, Maryland. 934 pp. (1958) $15.00.

Biologists and the biochemists have been treated in recent years to the periodic appearance of excellent symposia held at the McCollum-Pratt Institute of the Johns Hopkins University. Starting some years ago with the symposium on copper metabolism and progressing through considerations of phosphorus metabolism, enzyme action, amino acid metabolism and inorganic nitrogen metabolism, the series, under the capable editorship of William D. McElroy and Bentley Glass, switched two years ago to a survey of the chemical basis of heredity. The present volume on the chemical basis of development is the next in the series, and represents the proceedings of a symposium held at the McCollum-Pratt Institute in March of 1958. The prompt appearance of the volume is a tribute to the organizational genius of Messrs. McElroy and Glass, and to what must have been the splendid cooperation of the authors.

This volume is closely linked with, and is a logical sequel to the preceding volume on the chemical basis of heredity. It is an attempt to delineate some of the major problems in developmental biology which are different from, yet related to, the rapidly accumulating body of data on the nature of genes and primary gene action. Since, however, the problem of differentiation is far from a precise definition, the present volume must be somewhat more nebulous than its predecessor. This book is dedicated to Professor B. H. Willier of Johns Hopkins University, who retires after 18 years of teaching at Johns Hopkins. His own work on the developmental patterns of feathers in birds has contributed markedly to progress in developmental biology. One of Willier's former students, Clement Markert, who is at present his successor at Johns Hopkins University, delivered the opening talk which set the stage for the rest of the symposium.

The volume is divided into four major portions. (1) developmental cytology, (2) cellular and tissue interactions in development, (3) problems of specificity in growth and development, and (4) control mechanisms in development. In each of these large subdivisions, several distinguished biologists contribute data from their own research specialty. Most of the articles are followed by informal discussions that at once illuminate some of the points in the formal presentations and also give some clue to the lively intellectual atmosphere that must prevail at such conferences. A summation and evaluation of the entire conference is presented at the end of part four by Paul Weiss, and as usual, a very competent summary of the entire volume is presented by Bentley Glass, who by now must be considered to be without a peer in this uniquely useful endeavor.

The present volume is, like all of its illustrious predecessors, a fine contribution toward an understanding of the present status of a given field. The contributors have been selected with great skill. Their contributions are, in general, informative and lively, and the arrangement of articles in the book makes very good sense. The fact that this volume is somewhat less satisfying than its predecessor on the chemical basis of heredity is merely a reflection of the fact that the problem of differentiation has not yet yielded to experimental attack in the way that the problem of the genetic transmission of characters has recently.

Every reviewer feels an urge to criticize adversely, in at least one respect, the subject of his review. As a botanist I can easily find an excuse to criticize this volume. I presume the editors and planners of the symposium are aware of the fact that higher plants exist and that, in fact, there have been some recent interesting advances in our understanding of differentiation and development in these forms. Yet nowhere in this volume would one guess that this was true. It seems to be all right to include slime molds, since these are equally embraced both by botanists and zoologists; it seems perfectly respectable to include bacteria, molds, insects and mammals; it seems all right to include a study of organ differentiation in culture so long as this deals with animal materials. Why, then, are plants omitted? In view of the known devotion of the editors to interdisciplinary types of study, it would be interesting to have an answer to this question.

Nonetheless, I, as an experimental botanist, feel happy about the appearance of this volume and deem it, in general, a worthy companion to the other volumes in the series. Like its predecessors, it carries an author and subject index which make it a useful reference work. To coin a phrase, "This book ought to be in everyone's library". *A. W. Galston, Yale University, New Haven, Connecticut.*

GENETICS

Genetics. A Survey of the Principles of Heredity. Second Edition. A. M. WINCHESTER. 414 pp., illus. Houghton Mifflin, Boston. (1958) $6.25.

During the last decade a revolution has occurred in genetics, one which has not yet ended. The virtual identification of DNA as the hereditary material and the successful elucidation of its structure, intensive study of the phenomena of bacterial recombination, including transformation and transduction, studies of reproduction and recombination in viruses, pseudoallelism, "gene conversion", paramutation and many other events like these have stimulated a reexamination of genetic theory more intensive than any since the days of Morgan. Does the genetic material really consist of numerous separable components (genes) not resolvable into smaller components with the same properties? Do these components really maintain their respective integrities regardless of the simultaneous presence of differing forms? Is there really such a thing as multiple allelism? What is the relationship between the unit of transmission and the unit of mutation or the unit of physiological action? How are these three related to the physical and chemical structure of the hereditary material? We are indeed in the midst of the formulation of a new theory of the gene.

It is sad, therefore, to have to report that this latest textbook of genetics, reflects practically none of this ferment. Its format is certainly attractive; it includes a wealth of beautiful photographic and illustrative material. All of the new facts are there; indeed, the zeal in this respect is so great as to include an uncritical account of transformation in ducks. There are chapters on the survival of man in an atomic age, on the genetics of bacteria and their parasites, on plant and animal breeding, on human heredity (including the usual catalogue of curiosities and abnormalities). There is something for all audiences. The writing is simple and clear. There are problems. A list of references (all textbooks) is included at the end of the book.

The trouble is that all of this is imbedded in an organization which is at least thirty years old. The new facts are simple facts, incorporated into the text where convenient. No attempt is made to relate them to theory. Indeed, discussion of theory is minimal in all respects, with anecdote serving as a substitute. It is certain that students can learn all of the mechanical aspects of genetics from this book, but I fear that they would remain ignorant of its theoretical structure.

The theoretical structure of a science is its life blood, and genetics is notable for the beauty of its theory. To introduce students to its content in such a way as to obscure this structure and its problems is to deny them the excitement of intellectual rigor and scientific discovery. Surely the necessities of elementary presentation do not require this sacrifice. *Allen S. Fox, Michigan State University.*

Light, Colour and Vision. YVES LE GRAND. 512 pp., illus. John Wiley & Sons, Inc., New York (1957) $11.00.

In 1946 Le Grand published a volume in which the eye was considered as an optical instrument. This work was followed in 1948 by a second volume which considered the eye as a receptor of radiant

energy. The two points of view were combined and expanded in a single volume appearing in 1956. It is the second volume brought up to date (1956) which is represented by this translation. The book is the outgrowth of material presented in a course of lectures on Physiological Optics. Section A, a purely experimental study of the visual receptor as an instrument which responds to certain radiations, comprises three quarters of the book. Topics discussed in this section include radiant energy, photometric quantities, basic principles of colorimetry, luminous efficiency curves, thresholds, time and spatial effects, and anomalies of color vision. In Section B half of the space is devoted equally to photochemistry and electrophysiology; the remainder to theories of color vision.

As the author has emphasized, the point of view is essentially that of a physicist so that the book is weighted in that direction. It is one of the clearest, most concise, and congenial technical books ever written. The author injects his personality throughout and is not just an impartial reporter of facts. The considerable historical development and the many pertinent asides greatly enhance the discussion and are a welcome addition. The treatment is beautifully organized and developed so that a reader with a minimum of background in this field will experience no great difficulty in following the expositions and critical analyses. Insofar as this reviewer is concerned, the author's concluding hope that "the reader, in the course of coming to a fuller knowledge of that marvelous instrument, the human eye, has experienced as much pleasure as we have felt in describing it" is fulfilled. *V. G. Dethier, University of Pennsylvania.*

SCIENTIFIC PHILOSOPHY

The Cosmic Function of Life: A Transcendent Hypothesis. A. A. WILLIAMSON. Vantage Press, Inc., New York (1958) 78 pp., 2/bibliog., $2.50.

This small book is to be classified with "emergent evolution" concepts. Building on the familiar foundation of "three levels of life," (1) vegetable, (2) herbivorous, and (3) carnivorous animals, the author emphasizes the emergence of three more levels, (4) the human social level "supra-organisms or nations," (5) groups of nations, and (6) the final "One World." The whole is referred to as the "Pyramid of Life."

He uses the modern "rule of complementarity" by claiming the reversal of living organisms, of the second law of thermodynamics, resulting in "the regeneration, the restoration of the energy of the universe." This undoing of entropy is the basis for the idea that life has a cosmic function or to quote: "Biological redintegration offsets entropy in a universal energy cycle." Restoration of energy is accomplished by the biological evolutionary process which is here shown as having a specific end toward which it marches being therefore governed by the full equivalent of purpose." The drift into mysticism is enhanced when he states that in mankind "like crosses over from the realm of the physically embodied to the higher ethereal realm of spirit. Without that transformation the universe itself could not endure."

These in-part original emergent evolution concepts are clearly presented but whether the claim that the Pyramid of Life Philosophy "answers some of the most profound questions" may be questioned. The book nevertheless introduces some original ideas which are well presented. It is worth reading. *B. W. Wells, Professor, University of North Carolina.*

ZOOLOGY

Animal Camouflage. ADOLPH PORTMAN. 111 pp., illus. The University of Michigan Press, Ann Arbor, Michigan (1959) $4.50.

This book was first published in German as *Tarnung im Tierreich* in 1956. This English translation by A. J. Pomerans is another contribution of Ann Arbor's Science Library to a series of authoritative introductions for the general reader.

The author, at present a member of the Swiss UNESCO Commission, was formerly Professor of Zoology and Director of the Zoological Institute at The University of Basel. He introduces his subject with a historical note informing the reader that camouflage "played a prominent part in all discussions about the origin and the evolution of living organisms." He admits that not all authorities agree upon the significance of this phenomenon. "The problem of mimicry in particular has become a veritable no man's land of biological battle." His appeals for better examination of total behavior patterns prior to decisions will not be questioned.

Explaining camouflage as "optical deception" all observations included here are limited to vertebrates since "the role of the compound eye has not been sufficiently investigated."

The book is divided into four major sections dealing with vision, shape, coloring, and significant implications. Contributions of earlier works by such men as Thayer and Poulton are duly recognized. A number of interesting, apparently more recent experiments are described such as those showing the survival value of color adaptation. A minimum of documentation would have been worthwhile in support of these references.

The author does well in explaining the subtleties of his subject for the general reader. In discussing cases of species markings that blend with the landscape, he admits that he sees more here than "coincident disruptive coloration" and therefore must look upon these as "just one aspect of adjustment of separated parts to each other," a type of camouflage known as the joining effect or coaptation. He claims that the significance of coaptation has not been sufficiently recognized and suggests that displays of dead butterflies have been largely responsible for this oversight in that they are usually pinned to display the greatest wing spread, thus cloaking the effect of the parts on the whole.

He gives credit to the fishes for being the greatest masters of disguise and claims that the Amazon leaf fish of Brazil outdoes the much publicized Kallima butterfly in resemblance and behavior.

His material is copiously illustrated with sketches, diagrams, and photographs. Familiar and unfamiliar species from every continent are included. Readers will be convinced that animal camouflage is serious business in nature with definite survival value. He points out that recent research supports the functional role of vertebrate vision in this selective game. (Jane Van Zandt Brower's "Experimental Studies of Mimicry In Some North American Butterflies," as published in the March, June, and December, 1958, issues of *Evolution*, are of interest in this respect.)

Undoubtedly, increased studies in behavior and comparative psychology will add status to the phenomenon of optical deception. *Joseph P. McMenamin, American Institute of Biological Sciences.*

Zoogeography. Edited by CARL L. HUBBS. 510 pp., illus. American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D. C. (1958) Price to AAAS members, $10.50; non members, $12.00.

The subtitles of this book are so long that listing them verbatim would occupy most of the space allotted to a review. In essence, this volume contains the papers from two symposia, one held on the origin and affinities of the land and freshwater fauna of western North America at the Stanford meetings of the AIBS in 1957, and the other on zoogeographic problems of contemporary organisms held at the Indianapolis meetings of the AAAS later in the same year. The papers concern geology, climate, fresh water fishes and invertebrates, insects, birds and mammals by a galaxy of specialists too numerous to mention. Unfortunately the papers by R. C. Stebbins on reptiles and amphibia and by A. H. Miller on birds could not be completed in time for publication, and are represented by short statements. Still, there is a wealth of material in this double symposium and the book will be an essential reference for all interested in the zoogeography of North America. The editor has supplied a summary chapter which is essentially an analytical table of contents with an index graded according to thoroughness of treatment of various topics. The book is provided with author and scientific name indices, which greatly enhance its usefulness. *Joel W. Hedgpeth, Pacific Marine Station, College of the Pacific.*

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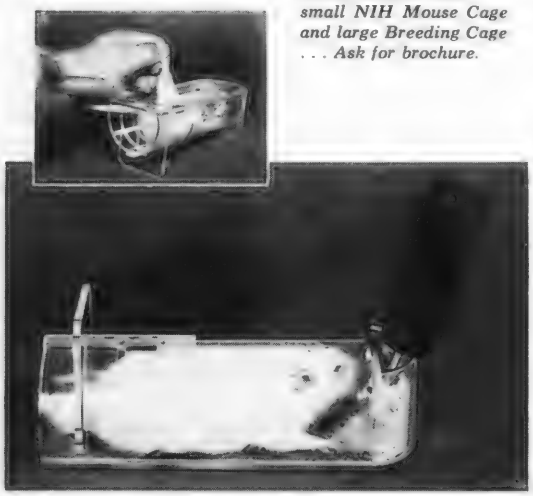

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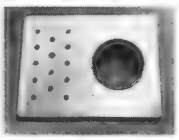

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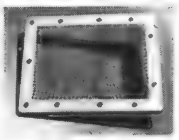

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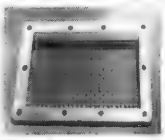

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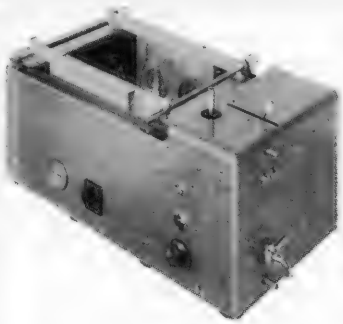

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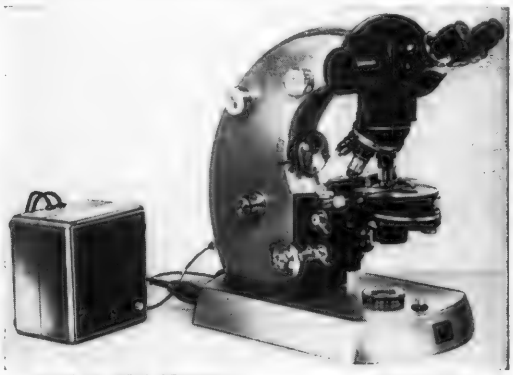

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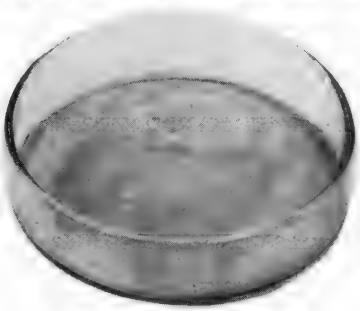

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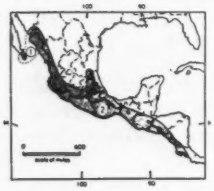

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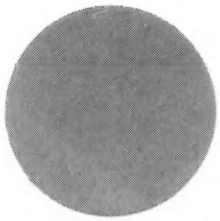

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He pays for cigarettes he never smokes

As a matter of fact, he never even opens the packs. This laboratory representative is collecting samples . . . samples of The American Tobacco Company's five famous brands. They're sent, untouched, to our Research Laboratory in Richmond, Virginia.

There, the cellophane wraps are carefully slit in half and removed from each pack. Then each half is separately tested for airtightness on a special laboratory device (see inset).

This test is part of a continuous, painstaking check on our cigarettes' freshness. Since factory freshness is guarded by the cellophane wrapper on each pack, all cellophane is tested before we use it. But the final test comes when the wrappers from packs actually purchased in stores are tested.

The freshness test is repeated hundreds of times each year. It helps make American Tobacco's brands the cigarettes of matchless quality.

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